NEW TECHNOLOGY AND THE FUTURE OF STEEL

HEARING

BEFORE THE

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INVESTIGATIONS AND OVERSIGHT

AND THE

SUBCOMMITTEE ON
SCIENCE, RESEARCH AND TECHNOLOGY

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NEW TECHNOLOGY AND THE FUTURE OF STEEL

MONDAY, JULY 22, 1985

House of Representatives, Committee on Science and Technology, Subcommittee on Investigations and Oversight and the Subcommittee on Science, Research and Technology,

Youngstown, OH.

The subcommittee met, pursuant to notice, at 10:46 a.m., in the Ohio Room, Kilcawley Center, Youngstown State University, Youngstown, OH, Hon. Harold Volkmer (chairman, Subcommittee on Investigations and Oversight) presiding.

Present: Representatives Volkmer, Traficant, and Packard.

Mr. Volkmer. Good morning. The Subcommittee on Investigations and Oversight of the Science and Technology Committee of the U.S. Congress will come to order.

The purpose of today's hearing is to continue oversight activities of the Committee on Science and Technology regarding research and development in the steel industry, and to define an appropriate Federal role for assisting in this effort. This hearing, jointly sponsored by the Subcommittee on Investigations and Oversight and the Subcommittee on Science, Research and Technology, follows a hearing last Wednesday in Washington, DC. That hearing focused on a new Federal effort to use the talent available in our national research laboratories to help the steel industry in developing new technologies.

I don't need to tell anyone in this room that the American steel industry is in difficulties. You live with it every day. Congress has spent a great deal of time recently attempting to address the challenge posed by steel imports. An equally important concern must be the industry's need for modernized plants and equipment. This hearing will be the first to discuss the problems that we will face in implementing new technologies, as well as associated problems like retraining the work force to prepare for the new age of steel.

I expect to learn much from this hearing about the Federal role in assisting our basic manufacturing industries as they compete in world markets. This will be a significant problem in the future, and the experience of the steel sector will be important in showing us a path to follow.

I now recognize my distinguished colleague, the gentleman from California, Congressman Ron Packard. Mr. Packard serves as the ranking Republican member on my Investigations Subcommittee. Mr. Packard.

Mr. PACKARD. Thank you, Mr. Chairman. I'd like to thank Mr. Traficant also for calling this in his district. I'm pleased to be here in Youngstown, which obviously is in the heart of the U.S. steel industry.

Few industries in America have been hit harder economically than the steel industry. The erosion of this industry has affected the lives of millions of people and the economies of thousands of communities like Youngstown, as well as the entire Nation. Massive layoffs have caused severe personal hardship and dislocations, not only in the steel industry but in the service and support businesses that surround the communities.

This subcommittee is here today to review what can and what needs to be done to restore the U.S. steel industry to international competitiveness. All analysts agree that competitiveness cannot be achieved without the development and application of new and innovative technology.

While there are other significant factors which affect the industry's competitiveness such as subsidization of foreign steel industries, trade policies and the demand for steel, technology is clearly one of the keys to survival.

The Science and Technology Committee has recognized the need for Federal support to assist in the research that would help the steel industry regain competitiveness and has supported funds for the initiation of a research program. We all know, however, that Government assistance, in whatever form, may be of little effect if it is not properly focused.

I look to the members of today's panels for their expert opinion on how and where Government can help best and most effectively in finding solutions.

Thank you, Mr. Chairman.

Mr. VOLKMER. Yes, I, too, wish to join with Congressman Packard in thanking your Congressman, Jim Traficant, for inviting us up here today.

Jim has been very involved in the Science Committee's progress and work in support of the steel initiative which we will be discussing today. And I know he is deeply concerned about the future of the industry. Jim, would you like to say a few words?

Mr. TRAFICANT. Certainly, Mr. Chairman. I thank you and Mr. Packard for coming in here today and agreeing to conduct this particular subcommittee hearing on investigation and oversight relative to the steel industry.

Those steel initiatives in evidence now, and the conditions that exist in the industry are looked at by many now as a dinosaur. I don't believe that that exists. I think we can do something about it.

I think the University of Cincinnati study reports that this area that I represent lost over one-third of its manufacturing jobs between 1977 and 1982. I had specifically attempted very hard to get onto that Science and Technology Committee because I feel that research and development and new technologies are integral to any future mobilization development, for the steel industry to be competitive and retain some of those jobs that we do have.

I would just like to say this as we are here today. I think perhaps today many of the people can hear the interaction of the industry and the Government initiatives and what particularly is happening with research and development, what is the real future as far as the steel industry is concerned and what do the steel companies themselves, what do they see as the projection for that future growth and competitiveness.

Finally, I think the Congress of the United States has a strong responsibility. And that responsibility is to insure that our Government assists and gives every opportunity available for one of the great industries of our country to be able to remain just that. And to maintain the competitive edge that we have.

So hopefully today that testimony that will be elicited from many fine witnesses will lead us closer to that.

So, Mr. Chairman, Mr. Volkmer, I really do thank you and Mr. Packard for being here. And specifically you for the leadership that you've shown in regards to steel initiatives and our committee's approach to the problems similar to this all around the country.

Mr. VOLKMER. Thank you very much. Our first panel this morning consists of Dr. David Cantor and Mr. Norman Robins. At this time I would like for them to come forward to the witness table.

Dr. Cantor serves as a specialist with the Economics Division of the Congressional Research Service, an arm of the Library of Congress created to provide professional, nonpartisan advice to Members of Congress on a wide variety of subjects. As an expert on the American steel industry, Dr. Cantor has been asked to describe its previous history regarding modernization, and the problems steelmakers face attempting to regain a competitive place in the market.

Mr. Robins is vice president for technology assessment with the Inland Steel Co. He is here today in his position as chairman of the steering committee for the new research partnership between the steel industry and the Federal laboratories, known as the Keyworth initiative. Mr. Robins will be discussing that program with us, as well as other technology changes we should expect in the industry.

Gentlemen, your prepared statements will be made a part of the record in their entirety. You may please feel free to summarize them. Dr. Cantor, you may proceed.

STATEMENT OF DR. DAVID CANTOR, SPECIALIST, CONGRESSIONAL RESEARCH SERVICE, LIBRARY OF CONGRESS, WASHINGTON, DC

Dr. CANTOR. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee, my name is David Cantor. I am a specialist in industry economics in the Congressional Research Service. I appreciate very much your invitation to participate in these hearings, and the opportunity to share with you my analysis of the steel industry.

I have submitted to the committee a prepared statement and with your permission will only summarize it today. Along with my prepared statement may I submit for the record two CRS studies from which my testimony is based: "America's Steel Industry: Modernizing to Compete"; and "Employment in the Steel Industry: the Shape of Change," by my colleague Linda LeGrande.

As you stated, my statement is intended to be an objective and nonpartisan analysis of the steel industry. I take no position whatsoever on any policy options you or your colleagues in the Congress might want to consider with respect to it.

Mr. Chairman, as I look back upon the recent and not so recent history of the steel industry, I am impressed by the fact that it is continually engaged in a modernization process.

One that saw the open-hearth furnace displace the Bessemer process in the 1950's and 1960's. It saw the basic oxygen process, continuous casting and direct reduction technologies introduced in the 1960's. And saw these and other technological changes proliferate throughout the 1970's and 1980's, displacing the now obsolete open-hearth furnace.

Up to the 1970's the industry could modernize in the more comfortable business environment of an oligopolistic market, where relatively few sellers dominate the supply. It was a market where sellers could behave independently of the forces of supply and demand.

But as we know from the experience of just the past few years, the market for steel has become highly competitive. The minimills, competing materials, and competition from relatively more modern foreign producers have become major forces in the marketplace. They have created a marketplace where pricing, outlook, and investment decisions of big steel are driven by the market forces of supply and demand.

To survive in this market the integrated steel companies must cut costs. They can do this by developing and installing even newer processes for making steel and by continuing to eliminate remaining inefficient capacity. They can attempt to reduce labor costs. And they are likely to try to do so by negotiating work rule changes, lower hourly compensation costs or both.

The issue is not that the industry will not adopt this strategy for survival in the competitive marketplace. I think it's fair to say that the industry has already adopted this strategy.

The issue is the adequacy of its effort, particularly with respect to modernization.

The issue is of interest to the Congress. Because when Congress passed the Steel Import Stabilization Act, as title VIII of the Trade and Tariff Act of 1984, it conditioned any import relief on the steel industry's reinvestment of its cash-flow from steel operations into those operations, so that the industry could become competitive on its own.

Mr. Chairman, my analysis a year ago of the industry's investment pattern in relation to cash flow indicated that the steel industry would have already been meeting the requirements of the law had the law been in effect then. And while I cannot predict the industry's future investment plans, I think it is fair to say that the steel industry will comply with the law.

But even the industry agrees that the amount of investment needed to become internationally competitive is far greater than its average annual investment of about $2.4 billion in the period 1979 to 1983.

The American Iron and Steel Institute states, and I quote, "the domestic steel industry, to maintain 95 million tons of shipments capability in the 1980's, needs to spend about $5.2 billion annually to insure adequate modernization of its facilities."

Thus, while there is every reason to believe that the steel industry will be in compliance with the law, there is also reason to believe that industry investment would be inadequate for it to become competitive in all markets.

The industry is likely to encounter great difficulty in raising capital. Conventional borrowing means interest rates in the range of 13.5 to 16.5 percent today. This is a premium of from 2 to 5 percentage points above the rate paid by high-quality, long-term borrowers. According to the recent Iron Age report on the minimills, even this relatively profitable segment of the industry is experiencing difficulty in conventional borrowing.

Now among the options for generating the capital the industry says it needs to modernize are the possibilities of reduced interest borrowing rates, and the joint ventures with foreign investors. Note, if you will, the purchase of a 50-percent interest in National Steel by Japan's Nippon Kokan Steel Co. And there are other examples as well.

Another option is to finance modernization by executing what amount to lease-purchase agreements. Bethlehem Steel Corp. is doing just that in order to acquire its two continuous casters at Burns Harbor and Sparrows Point.

Obviously, Government could provide some funding directly or indirectly to finance steel industry modernization. To some extent it is already doing so. There are various provisions built into our tax code that benefit the industry. The Department of Energy is involved in a collaborative effort with the United States Steel Corp. and Bethlehem Steel Corp. to develop a near-net-shape casting process. The American Iron and Steel Institute and the National Bureau of Standards are jointly engaged in an R&D effort to develop sensors to enhance quality control of steelmaking. Your committee authorized expenditures of, I believe, $6 million by the Department of Energy for steel research, and additional funds for the National Bureau of Standards.

I emphasize these questions of financing modernization, Mr. Chairman, because, whatever the results of the efforts of the scientists and engineers in developing new technologies for steelmaking, they translate into a more modern, efficient, and competitive steel industry only if they can be implemented. But in view of the stagnant outlook for steel demand, the existence of excess capacity in the industry today, and the considerable apprehension on the part of the industry regarding the effectivness of the President's voluntary restraint program, it would not be surprising if the industry implemented new processes only with considerable caution.

As for industry employment, most analysts agree that modernization will not result in a resurgence of employment in the steel industry. For example, a continuous caster to replace ingot casting and the milling of ingots into semifinished shapes would, according to the recent report of the National Academy of Engineering, reduce labor input for only these processes by about 50 percent. Unless demand for domestic steel rises, it is unlikely that workers on layoff or displaced owing to plant closings would be able to reclaim their jobs.

The LeGrande study, prepared at the request of the Subcommittee on Science, Research and Technology of the House Science and Technology Committee, and authorized by them for release here, finds that employment in the steel industry could fall over the next decade, although not substantially from today's level.

Interestingly, this study also finds that the composition of the labor force in the steel industry will change significantly in the next 10 years. The lower skilled personnel will give way to more highly skilled and educated workers. Thus, if employment were to stay at present levels, many of those currently employed would not be able to retain their jobs.

Mr. Chairman, let me say in closing that I find the steel industry has demonstrated a willingness to modernize and to commit resources to that effort. And I would expect that to continue. This is, I think, most encouraging because such an attitude is critical to its meeting that challenge of adjusting to a competitive marketplace. America's steel industry, in spite of foreign competition and stagnant demand, appears to me to be anything but a dying industry. But, Mr. Chairman, I am not deluded into thinking that the steel industry will emerge as it is today from its current struggle to become fully competitive.

Thank you very much, sir.

[The prepared statement of Dr. Cantor and two Congressional Research Service studies follow:]

Congressional Research Service
The Library of Congress

Washington, D.C. 20540

PREPARED TESTIMONY

HEARINGS ON "NEW TECHNOLOGY AND THE FUTURE OF STEEL"

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Committee on Science and Technology
U.S. House of Representatives

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David J. Cantor
Specialist in Industry Economics
Economics Division
July 22, 1985

Mr. Chairman and Members of the Committee,

My name is David Cantor. I am a Specialist in Industry Economics in the Economics Division of the Congressional Research Service. I appreciate very much your invitation to participate in these hearings, and the opportunity to share with you the results of my analysis of the steel industry.

Many claims are made, Mr. Chairman, that the current difficulties facing the steel industry are grounded in management decisions of the past. We hear that the industry overbuilt capacity. We are told that the industry took advantage of its market power and was slow to innovate and modernize. The industry itself tells us that it erred in allowing costs to rise in an almost unbridled way. No longer is the industry dominated by a small group of integrated producers that enables it to dictate price and quantity in the steel market. It now includes a new breed of steel-makers, the "minimills", that have become a significant force for competition in the declining or at best stagnant steel market. They and foreign steel producers that sought overseas markets for themselves, have created a highly competitive market environment. Thus, the integrated segment of our industry, which was virtually the only supplier in the U.S. steel market in the past, is unable to utilize its capacity efficiently and profitably. More important, perhaps, the industry finds itself hard pressed financially to undertake those efforts that could conceivably shore up its ability to meet its competition head-on and with reasonable prospects for success.

My research and analysis of developments in the steel industry suggest to me that the fundamental problem of the industry is the adjustment to changes that have occured in the U.S. steel market. While, in the past, we economists would characterize the structure of the steel market as an oligopoly -- a market where only a few sellers supply the product, today, the steel market is highly competitive. Thus, while management decisions relating to price and investment could be made largely independent of the combined market forces of supply and demand in the past, today they are driven by those market forces.

I would suggest, also, that, even in the past, when the industry faced relatively little competition from abroad, from competing materials, and from new entrants into the industry, America's steel industry was to a degree an innovator in developing and implementing new and more efficient processes to make steel. It could innovate, funding its investment from revenues generated in the oligopolistic market that it dominated. In the present market environment of competition, it continues to be an innovator in adopting new technologies for steelmaking. Thus, while the evidence may support the thesis that the steel industry has not simply sat back and allowed itself to fall behind with respect to technical innovation, the questions today are the adequacy of its efforts in the past, and its ability to make the additional investments necessary to survive -- the minimal goal of any seller even in the theoretically ideal, purely competitive market.

The Post-World War II Period To 1980

Mr. Chairman, strong claims are made that management decisions of the past may be responsible for the steel industry's dilemmas of today. In particular, let me address the question of overcapacity. If the steel industry overbuilt its capacity in the years and decades following World War II, those decisions resulted in part from federal government policy. Analysts -- both those regarded as critics of the industry (Donald Barnett and Louis Schorsch, for example) and those viewed as sympathetic to it (Father William Hogan, for example) -- agree on this point. President Truman proposed in his State of the Union Message in 1949:

> (legislation) to authorize an immediate study of the adequacy of production facilities of materials in critically short supply, such as steel; and if found necessary, to authorize government loans for the expansion of production facilities to relieve such shortages, and furthermore to authorize the construction of such facilities directly if action by private industry fails to meet our needs.

The industry disagreed, contending that the outlook for steel demand did not justify expansion. History is on the side of the industry. In 1951, America's steel industry had about 105 million tons of capacity. Yielding to government pressure, it expanded capacity to about 136 million tons by 1960, at an annual rate of growth of about 2.9 percent. Virtually all of this added capacity was in the form of open-hearth furnaces, which replaced the obsolete Bessemer furnaces. In this same period, U.S. steel demand, while fluctuating in response to changes in the business cycle, actually declined at an annual rate of about -0.8 percent. Although excess capacity was created in the industry, the major steel producers did not hold down prices, which rose at an annual rate of nearly 6 percent.

Let me cite one more example of the effect of government policy on the expansion of steel-making capacity in the United States. In 1954, Bethlehem Steel Corporation attempted to acquire the facilities of Youngstown Sheet and Tube Company. Bethlehem wanted productive capacity in the midwest to serve the growing automotive and appliance markets. The Department of Justice opposed the acquisition on antitrust grounds, a decision that was upheld in the courts in 1958. As a result, and in order to penetrate the midwest steel markets, Bethlehem built in the early 1960s the first large "greenfield" plant constructed in the United States since 1952, its plant at Burns Harbor, Indiana. Let me note that, while government policy may have influenced the expansion of capacity in this case, the decision to build Burns Harbor brought with it one of the first large-scale installations of what has become the predominant steel-making process in the world today, the Basic Oxygen Process. Thus, government policy may have coincidentally contributed to technological innovation and modernization of America's steel industry.

Major expansion of steel-making capacity came to an end by 1960, because of lack of growth in demand and the absence of government pressure to expand steel-making capacity. In the 1960s, steel capacity grew by about 8 million tons, at an annual rate of about 0.6 percent. In this same period, demand grew at a rate of about 3.1 percent per annum. Prices continued to rise in this decade.

Then, we come to the 1970s. In the first half of this decade, there was a substantial net increase in total industry capacity to about 180 million tons. But there are several reasons for this. First, domestic steel demand was rising from about 100 million tons in 1969-70 to over 120 million tons in 1973. Second, we begin to detect the strong presence of the "minimills" into the market; these are the relatively small companies that produce steel from scrap metal in electric furnaces. More than two-thirds of the 12.5-million ton expansion of electric furnace capacity took place in the "minimill" segment of the industry from 1972 to 1975. Furthermore, from 1975 on, virtually all of the growth of electric furnace capability took place in the "minimills".

A third reason for the expansion of steel capacity in the first half of the 1970s is that the large integrated steel companies were engaged in the process of modernization. In particular, the integrated companies were ridding themselves. of outmoded and obsolete capacity. Between 1972 and 1975, the industry closed down nearly 20 million tons of relatively inefficient open-hearth capacity, replacing it with 15 million tons of the more efficient Basic Oxygen capability.

While expansion of capacity reached its peak in the mid-1970s, it declined thereafter. For all intents and purposes, the capacity reduction of about 15 million tons in the last half of the 1970s was the result of the continuing process of modernization, namely the elimination of excess open-hearth capability, and the emergence of a declining trend in steel demand. Electric furnace capacity grew by about 5 million tons, mainly in the "minimill" segment of the industry. Basic Oxygen capability was constant at about 96 to 97 million tons The most important development in the last half of the 1970s was the closing down of more than 20 million tons of inefficient open-hearth furnace capability.

The post-World War II era provides examples of modernization other than replacing the obsolete steel-making processes of the past - Bessemer and open-hearth. The integrated steel companies were active in this modernization process. In 1967, U.S. Steel Corporation commissioned the first continuous caster in the United States for its Gary, Indiana works. National Steel and McClouth Steel installed continuous casters in 1968 and 1969.

In the 1960s, America's steel industry was active in developing the process for the direct reduction of iron ore (DRI). Among these efforts were those of Armco, which built and operated a pilot plant in Kansas City, Missouri in 1966 and later, in 1972, a full-scale commercial plant in Houston, Texas. Two other DRI plants were built in the early 1970s: the Midland-Ross plant in Portland, Oregon and the Georgetown Steel plant in Georgetown, South Carolina. None of these DRI ventures proved to be economically viable, however, owing to the sharp increases in natural gas prices in the late 1970s; the DRI process used natural gas as a basic energy input. Be that as it may, these examples indicate that the U.S. steel industry was clearly experimenting with, developing, and implementing new productive processes in the decades gone by -- although the extent to which it made technical progress may have been influanced by its market structure.

Before leaving the past, Mr. Chairman, it is important to point out that the oligopolistic structure of the steel market permitted the dominant firms in the industry to adopt pricing strategies other than those of the competitive market place. In particular, the claim is made that steel companies engaged in what economists label, "administered pricing". That is, price is determined by costs to which a percentage mark-up is added. This is the conclusion of Dr. Zoltan Acs in his recently published study of the steel industry. It is almost taken for granted by one of the industry's most prominent critics, Dr. Robert Crandall. Indeed, though this strategy is becoming increasingly difficult to implement in today's market, it has become the norm on which analysts base their analyses of the industry: for example, the Congressional Budget Office (CBO) estimated the price effects of a steel import quota using an equation in which input costs were explanatory variables. In a market where sellers can exert a significant influence on supply, an administered pricing strategy might be considered a prudent business decision. But when the structure of the market changes, this pricing strategy gives rise to the problem of not being able to compete on the basis of price.

This is why we hear one steel industry executive after another confess that they allowed costs to run rampant as recently as the early 1970s. Perhaps, they permitted costs to rise so sharply, because they did not recognize that the market structure was changing, and the industry did not recognize the need to adjust to these changes. In testimony before the Senate Judiciary Committee on July 1, 1983, David Roderick, the CEO of United States Steel Corporation, stated:

> Clearly, during the 1970's, it (labor costs) ran amok. Incidentally, I am not, you know, banging the steelworkers for this. Keep in mind that we steel companies signed those contracts, so this is joint bargaining. We did this together. We did not do it very well, in my opinion. We got each other into trouble.

Dr. Acs indicates that demand was a minor factor in influencing price, and that costs of production -- mainly, those of labor (which were negotiated with the United Steelworkers on an industry-wide basis) -- were dominant in explaining steel price behavior. The point is that, in the past at least, the steel industry could accept higher costs of production, passing them through to buyers, because the structure of the market it served was an oligopoly, where competition from other sellers at home and abroad and from other materials was not a significant concern, and where price could rise above the point at which the market would clear.

The Steel Market Today

Mr. Chairman, if I were to use one phrase to describe the steel market today, it would be "adjustment to competition": competition for market share in a stagnant or declining market; competition with the "minimills"; competition with competing materials; and, competition with imports. This competition has been very tough on the integrated segment of the industry at least, although even the "minimills" are experiencing difficulty in the marketplace. Indeed, the Barnett-Schorsch study of the steel industry is aptly titled — Steel: Upheaval in a Basic Industry.

First, the market for steel is stagnant. For about the past decade, demand for steel has fluctuated around the 100 million ton level. U.S. steel demand reached a high point of nearly 117 million tons in 1978; its low point was about 76 million tons in 1982. In 1984, U.S. steel demand was about 98 million tons, and forecasts of future demand by Data Resources, Incorporated suggest that steel demand will be at levels of about 100 million tons through the rest of this decade.

Steel demand has not responded to economic growth. One reason for this is the emergence of substitute materials -- especially, plastics and aluminum. Indeed, during the 1970s and into the 1980s, a significant drop occurred in the so-called steel intensity of the economy; that is, the ratio of steel input to real Gross National Product. My analysis of trends in steel intensity indicates that it fell by 22 percent in the 1970s, and by another 14-15 percent in the first half of this decade. The downsizing of cars and the increased use of lighter weight materials in cars and construction help to explain this structural shift away from steel. The only bright spot in this analysis is that the data imply that further declines in steel intensity are likely to be very modest. The point is that steel demand is not likely to rise significantly.

At the same time, we have significantly more sellers in this stagnant market. The large integrated companies clearly dominate in terms of capacity: according to data compiled by Acs, the seven largest companies have over 110 million tons of capacity, but there are also at least 60 "minimill" companies with expanding capacity. These "minimills" have been extremely successful in penetrating the market for structural products. In 1975, electric furnace output, a reasonable surrogate for "minimill" activity accounted for 20 percent of total U.S. steel production; by 1984, they accounted for about 35 percent of the nation's steel output. Their emergence as a force in the industry makes the steel market more competitive, effectively requiring the integrated companies to adjust to the changes in market structure.

Why are they so successful? One, they are small. They do not have to make the investments in blast furnaces and large steel-making furnaces that the integrated companies must make. Two, they specialize at least for the present in a small range of products. They do not have to have different rolling mill complexes. Three, they are located close to their markets.

Thus, their customers incur lower transportation costs than they would if they bought from larger but more distant mills. Four, many employ non-union labor. Thus, they avoid some of the high labor costs and work rules that the unionized integrated companies must operate under. Five, there is some evidence that they benefit from local government assistance: at least one of the most prominent "minimill" companies, Nucor, obtained a substantial amount of its financing through industrial revenue bonds.

But even the future of the "minimills" is debatable. A recent article in Iron Age, a respected trade journal, reported that the traditional market for "minimill" products may be saturated. The article quotes Kenneth Iverson, the CEO of Nucor, as saying:

> In the past, the primary competition for mini-mills was foreign suppliers and integrated producers. Over the last three or four years, this has changed so that the primary competitors today are other mini-mills -- and I expect that to continue into the future.

While praising their accomplishments, the American Iron and Steel Institute observed in its 1985 annual report:

> But now, minimills face the problems of growing maturity. Their financial success is based on high volume sales at low per ton profit margins. But economic growth in some traditional minimill markets seems to be slowing, and as they try to move into higher value products, they find themselves competing for a larger share of still depressed markets.

Furthermore, the "minimills", being scrap-based, are likely to encounter significant problems of quality control, should they expand their product line into flat-rolled products. The uniformity of the quality of the raw material inputs is more important in the latter than in the structural and bar products that "minimills" now produce.

The integrated companies compete not only with other industries and the "minimills" for a share of the stagnant steel market, but also with foreign imports. In 1984, the United States imported steel from over 50 countries. Our steel imports represented over one-fourth of the domestic market. There is some indication that foreign steel companies — in Taiwan, for example -- built new capacity to capture overseas markets. Even today, new steel mills are being built in third-world countries: Nigeria and Pakistan recently opened or are close to completion of their new steel mills; Venezuela is constructing a 4.8 million ton mill, which, according to a Forbes magazine article, will produce steel to earn foreign exchange. Despite our industry's efforts to modernize, the steel industries of most other countries are newer than our industry, embodying state-of-art technology. Labor costs overseas are a fraction of ours. Even with the import restraint expected as a result of the President's steel program, foreign producers could expect to hold 20 percent of our market.

The integrated steel industry has attempted to respond to the sluggish marketplace for steel and to the competition it faces at home and abroad. Father Hogan discusses the efforts of the major companies to adjust to the market in his book, Steel in the United States: Restructuring to Compete. I addressed the industry's efforts in my report, America's Steel Industry: Modernizing To Compete; with your permission, I submit this report for the record. Essentially, I found three elements to the steel industry's modernization efforts:

1. rationalization of existing capacity;
2. adoption of currently available state-of-art technology; and
3. research and development of new technologies for steel-making.

Clearly, in a smaller market, a critical element of modernization is the elimination of old and obsolete plant. We saw that the industry was engaged in this effort in the 1970s. Perhaps of greatest long-term promise, we observed that the integrated industry replaced some of its older outmoded capacity with more modern plant. Indeed, let me cite some of the data developed by Barnett and Schorsch on the age of steel plants in the United States and Japan; I think this data will put to rest the idea that our plant is "ancient" and, thus, unable to compete. On average, our steel-making furnaces are about 2 years older than those in Japan; our continuous casters are about the same age. Where we lag behind is in the product rolling mills: our mills are from 4 to 10 years older than those in Japan.

Our industry has moved forward vigorously to install state-of-art technologies, although not as aggresively as in other countries. From 1981 to 1983, we had a positive rate of growth of continuously cast output, while most other countries had negative growth rates. In this period, a period marked by severe recession, our steel industry constructed or commissioned more than 16 continuous casters. In 1984, nearly 40 percent of our steel output was continuously cast, nearly double the share in 1980; as a result, the industry is making headway in catching-up with foreign producers in the use of this technology.

Companies are planning to install new direct reduction processes using coal, thereby bypassing the coking and blast furnace operations. Wily Korf recently announced plans to install this process in his Wallingford, Connecticut plant. Weirton Steel, formerly part of National Steel, has similar plans, and is seeking funding from the Department of Energy to proceed with them.

Smaller, incremental changes in technology are being installed in steelmaking operations. New ladle refining systems are in place in Armco's Ashland, Kentucky plant; U.S. Steel Corporation is installing such a system at its Fairfield, Alabama plant.

LTV Corporation is engaged in a joint venture with Sumitomo Corporation to install a state-of-art electrogalvanizing mill at its Cleveland works. Again, in spite of the stagnant market, we find continued evidence that the industry is installing or willing to install current state-of-art technology to enhance its ability to produce steel of high quality and in competition with imports.

The modernization effort does not stop here, however. The steel industry in collaboration with federal agencies is engaged in research and development efforts to find even more efficient ways to produce quality steel products. You know of the sensor research being undertaken at the National Bureau of Standards. This effort, if successful, would permit the industry to monitor more precisely the quality of the steel as it moves through the various stages of production: from molten metal to ingots to semifinished shapes to final products. Similarly, U.S. Steel Corporation and Bethlehem Steel Corporation have joined together with the Department of Energy to develop processes for near net shape casting. This process, if successful, would permit the industry to produce slabs one-fourth the thickness of conventional slabs; these thinner slabs would require less processing than the conventional product, with the result of lower costs.

Thus, we see the industry responding to the forces of competition by utilizing its total plant more efficiently, implementing new processes, and looking forward to still newer developments in steelmaking technology. America's Steel Industry is indeed modernizing to compete.

Prospects and Problems In The Future

Mr. Chairman, as I look back upon the recent and not-so-recent history of the steel industry, I am impressed by the fact that it has continually engaged in a modernization process. Up to the 1970s, it could undertake this effort in a more comfortable business environment: the "minimills", substitute materials, and competition from relatively more modern foreign industries were not major forces affecting it. But, as we know from the experience of just the past few years, all of these factors have created a major change in the steel industry's business environment; they have thrust it into a highly competitive market.

To survive in this market, integrated steel companies must cut costs. They can do this by developing and installing new processes for making steel. They can do this by eliminating inefficient capacity, replacing it in whole or in part by more modern furnaces and rolling mills. They can attempt to reduce labor costs, and are likely to do so by negotiating work rule changes, lower hourly compensation costs, or both.

The issue is not that the industry will not adopt this strategy for survival in a competitive marketplace; I think it is fair to say that the industry has adopted this strategy. The issue is the adequacy of the effort -- particularly in its modernization program. This issue is of interest to Congress, because, when Congress passed the Steel Import Stabilization Act as Title VIII of the Trade and Tariff Act of 1984 (P.L. 98-573), it conditioned any import relief on the industry's reinvestment of its cash flow from steel operations into those operations. Congress and the President were willing to restrict competition in the U.S. steel market for five years, but only if the industry was willing to undertake a modernization program that would enable it to become competitive on its own, one that its former market structure did not require of it.

Mr. Chairman, my analysis of the industry's investment pattern in relation to its cash flow a year ago indicated that the industry was already meeting the requirements of the current law. From 1979 to 1983, the industry invested about 3.5 billion dollars more in steel operations than it generated in cash flow from those operations; over these five years, it invested about 11.5 billion dollars in steel operations, while it generated from operating income and depreciation allowances, about 7.9 billion dollars. While I cannot predict the future investment behavior of the industry, I think it is fair to say that the industry is likely to meet the requirements of the law by investing its cash flow from steel in steel.

But even the industry would agree that the amount of investment necessary to become internationally competitive is far greater than its average annual investment of about 2.4 billion dollars in steel operations in the recent past. President Reagan's Steel Advisory Committee, which functioned from November 1983 to November 1984 with participants from industry, labor, and government, reported that the necessary amount of investment in steel would be in the range of 5 to 5.5 billion dollars per year. (I would note that the Committee's report represented a consensus of the views of its members.) The American Iron and Steel Institute claims that "the domestic steel industry, to maintain 95 million tons of shipments capability in the 1980's, needs to spend about $5.2 billion annually to insure adequate modernization of its facilities." Donald Trautlein, CEO of Bethlehem Steel Corporation, in his testimony before the Senate Finance Committee on June 13, 1985 on the President's tax reform proposal, stated that the industry would fall short of its desired investment goals by about 1.5 billion dollars. Thus, while there is every reason to believe that the steel industry will be in compliance with the law, there is also reason to believe that industry investment would be inadequate for it to become competitive in all markets.

Now, frankly, the industry's estimate of its investment requirements may be inflated. They assume a shipment level of 95 million tons, which implies either a massive surge in demand or virtually no imports. As I have already noted, the demand for steel in the forseeable future is projected by Data Resources, Incorporated to be about 100 million tons per year. The only other possibility is for imports to drop to levels of 5 to 7 million tons, if domestic steel shipments are to rise to 95 million tons; this, too, is improbable. Even if the industry's estimate of capital requirements is too high, it is probably fair to say that they will need substantially more per year than they have invested in steel operations in the recent past.

The industry is likely to encounter great difficulty in raising this capital. Conventional borrowing means interest rates in the range of 13.5 to 16.5 percent today, a premium of from 2 to 5 percentage points above the rate paid by high quality long term borrowers. According to the recent Iron Age report on "minimills", even firms in this segment of the steel industry are experiencing difficulty in borrowing.

Indeed, if the steel industry could borrow at substantially reduced rates of interest, not only would it be able to reduce capital charges, but also it would be better able to implement the results of the research and development efforts going on, and benefit from the lower costs derived from new technology. Consider the following optimistic scenario. I recently estimated that a 3.5 percentage point reduction in the interest rate paid by steel companies could lower costs by about 14 dollars per ton just owing to the change in the rate. In addition, if the companies borrowed to install a continuous caster, total costs of production could be reduced by still another 35 dollars per ton.

Among options for generating the capital the industry says it needs to modernize other than conventional borrowing in the capital markets, there is the possibility of more joint ventures with foreign investors. Note, if you will, the purchase of a 50-percent interest in National Steel by Japan's Nippon Kokan Steel Company. There are other examples as well. Nisshin Steel (Japan) has a 10-percent equity interest in Wheeling-Pittsburgh Steel Company. LTV Steel has a joint venture with Sumitomo Steel (Japan) at its electrogalvanizing plant in Cleveland. Kawasaki Steel (Japan) is providing some of the capital to refurbish the Fontana plant of California Steel Company. Canadian steel companies have invested heavily in some of our "minimill" companies: Chapparall and Raritan River Steel. Joint ventures with foreign steel companies emerge as a real possibility for generating capital.

Another option is to finance modernization by executing what amounts to lease-purchase agreements. Bethlehem Steel Corporation is doing just this in order to acquire its two continuous casters at Burns Harbor and Sparrows Point. The Austrian manufacturer of the casters, Voest-Alpine, will receive a payment per ton of steel produced by the casters at the two plants.

Obviously, government could provide some funding directly or indirectly to finance steel industry modernization. To some extent, it is already doing so. There are already various provisions built into our tax code that benefit the industry. The Department of Energy is involved in a collaborative effort with United States Steel Corporation and Bethlehem Steel Corporation to develop a near net shape casting process. The American Iron and Steel Institute and the National Bureau of Standards are jointly engaged in a research and development project to develop sensors to enhance quality control of steel-making. Your Committee authorized expenditures of, I believe, six million dollars by the Department of Energy for steel research, and additional funds for the National Bureau of Standards.

I emphasize these questions of financing modernization, Mr. Chairman, because, whatever the results of the efforts of the scientists and engineers in developing new technologies for steel-making, they translate into a more modern, efficient, and competitive steel industry only if they can be implemented. There is a major difference between technological innovation and economic innovation. In the former, new processes may be developed. In the latter, they must pass the tests of economic viability. Thus, in view of the stagnant outlook for steel demand, the existence of excess capacity in the industry today, and the considerable apprehension on the part of the industry regarding the effectiveness of the President's import restraint program, it would not be surprising if the industry implemented new processes with considerable caution.

Finally, Mr. Chairman, I address the question of the outlook for employment in the steel industry. Most analysts agree that modernization of the steel industry will not result in a resurgence of employment in the industry. For example, installation of a continuous caster to replace ingot-casting and the milling of ingots into semi-finished shapes would, according to the recent report of the National Academy of Engineering, reduce labor input per ton of steel by about 50 percent. Except that demand for domestic steel would rise, it is unlikely that persons on layoff or displaced owing to plant closings would be able to reclaim their jobs.

Let me share with you a report by my colleague at CRS, Linda LeGrande, that was commissioned by the Subcommittee on Science, Research, and Technology of the House Science and Technology Committee, and that they have authorized me to release to you. LeGrande finds that the level of steel industry employment over the next decade may not fall substantially from present levels. But, she also finds that the composition of the labor force in the steel industry will change significantly in the next ten years. The lower skilled personnel will give way to more highly skilled and educated workers. Thus, another implication of modernization is that the characteristics of the labor force are likely to be very different from today's steel workforce. Even if employment were to stay at present levels, many of those currently employed would not be able to retain their jobs. Mr. Chairman, I submit for the record and consideration of this committee, the report by Linda LeGrande, Employment in the Steel Industry: The Shape of Change.

Mr. Chairman, in closing, I find the steel industry to be one that has demonstrated a willingness to modernize and to commit resources to that effort, and I would expect that to continue. This is, I think, most encouraging, because such an attitude is critical to its meeting the challenges of adjusting to a competitive marketplace. America's steel industry, in spite of foreign competition and overall sluggish or declining demand, appears to be anything but a dying industry. But, Mr. Chairman, I am not deluded into thinking that the steel industry will emerge as it is today from its current struggle to become fully competitive at its present size. There is still much obsolete capacity in place. Grave doubts exist regarding the ability of the industry to finance its modernization. I suppose that the outlook for the industry can best be expressed by an industry spokesman, Donald Trautlein, who closed his address to the American Iron and Steel Institute at its 1985 annual meeting with these words:

> . . . we are taking significant steps forward — and we're determined to take more. A lot of good things are happening — and we are making progress. While our industry may be slimmer by 1990, it will also be a lot smarter, a lot stronger, and a lot more competitive.

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AMERICA'S STEEL INDUSTRY: MODERNIZING TO COMPETE

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ABSTRACT

In spite of growing foreign competition and declining steel demand, America's steel industry has been modernizing aggressively to compete in a smaller market. This report details this activity, which consists of: elimination of outmoded capacity, expansion of continuous casting and electric furnace capability, and development and adaptation of new technologies for steel-making.

AMERICA'S STEEL INDUSTRY: MODERNIZING TO COMPETE

INTRODUCTION AND SUMMARY OF MAJOR CONCLUSIONS

America's steel industry, in spite of foreign competition and overall sluggish or declining demand, appears to be anything but a dying industry. While some analysts point to the reduction in steel-making capability in the United States as an indicator of the industry's decline, there is other evidence that the industry is aggressively implementing programs of rationalization 1/ and modernization to maintain or increase its stature among the world's steel industries, especially in the U.S. market, where import penetration has reached levels of about 20 percent.

While the outlook for the U.S. steel industry vis-a-vis its competitors elsewhere is encouraging, it will very likely be a smaller industry. Steel demand in the United States and throughout most of the world generally is not expected to increase enough to sustain rapid growth in steel production. A more competitive worldwide environment has to emerge as steel-producing countries -- including the United States -- compete for shares of a smaller market. In response to these changed market conditions, America's steel makers have eliminated and will most likely continue to eliminate inefficient practices, and

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1/ Rationalization is the process of reorganizing the industry to achieve greater efficiency. It includes consolidation of companies, elimination of obsolete capacity, and modernization. In this report, the term refers mainly to the elimination of obsolete capacity. See, Hogan, William T., S.J. World Steel in the 1980s: A Case of Survival. Lexington, Lexington Books, 1983. p. 21.

will most likely continue to expand the use of new technologies. In effect, the industry is upgrading its ability to produce better quality and lower-cost steel, albeit a smaller quantity.

This report details the changes that have taken place in steel-making in the United States in recent years in relation to industry developments worldwide. To provide a perspective on the market, generally declining or sluggish, at best, the first section of the report deals with trends in the demand for steel in major steel-producing countries. The second section of the report discusses the rationalization of America's steel-making capacity in response to the declining trend in domestic and, indeed, industrial country demand for steel. The third part of the report details trends in the modernization of remaining capacity and of other stages of the production of steel products, and of the continuing expansion of electric furnace capability, the most modern and widely-used steel-making process. Finally, the last section provides an overall summary of the data developed in the report, and points out particular areas of concern regarding the U.S. industry.

The report is based on data developed by Chase Econometrics that not only provide historical information, but also projections on a consistent basis for major steel-producing countries. 2/ Also, the data are sufficiently detailed to permit examination of steel-making capability by process for all of the major steel-producing countries and regions of the world. Through at least 1981, the Chase Econometrics data are historical. Their basic source of data was the International Iron and Steel Institute in Belgium.

The data for 1982 and future years are projections of econometric models used by Chase Econometrics. While all forecasts are subject to error, they

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2/ Chase Econometrics. The World Steel Outlook to 1995. Volume I. July 1983. 173 p.

are presented in this report to provide indicators of developments in the steel industries of the United States and its major competitors. Nevertheless, the reader is cautioned that the 1983 data and those for future years are forecasts and subject to errors inherent in such exercises.

It should also be noted that the data presented herein are expressed in short tons (1 ton = 2,000 pounds); the Chase Econometrics data as published are expressed in metric tons (1 ton = 2,240 pounds). This conversion was made, because most discussions of the American steel industry are carried on in the context of short tons.

There are five major findings in this report.

(i) Competition in the steel industry is and will likely be for market share of a sluggish and declining market. Thus, modernization will be motivated more by the need to achieve greater efficiencies in steel production to be able to compete with foreign producers rather than for growth.

(ii) A major thrust in the modernization of America's steel industry has been the replacement of much of its obsolete open-hearth and older basic oxygen capacity. This rationalization, prompted by the declining trend in steel demand, has been pursued, also, in other industrial countries, and at a faster pace than in the United States.

(iii) A second facet of modernization in America's steel industry has been the relatively rapid expansion of the electric furnace. Indeed, the United States is the world leader in the use of this process, and is continuing to install new electric steel-making capability faster than any other country.

(iv) The third emphasis in the modernization process is the rapid expansion and use of new technologies to increase efficiency and lower production costs of steel products. America's steel industry enjoys a relatively high rate of growth in the use of the continuous casting process vis-a-vis other industrial countries, even during the recent period of recession in 1981 and 1982. Ladle technology, quality control techniques and methods for direct casting of finished steel products are receiving greater attention in the United States and elsewhere. These measures do not increase the total quantity of raw steel produced; instead, they represent efforts to produce better quality finished steel products and at lower costs.

(v) Despite improvements in and the modernization of steel-making in the United States, there remain areas of concern, if the U.S. steel industry is to attain a level of international competitiveness. First, America's steel industry is slow in eliminating its obsolete open-hearth capacity in relation to other countries, and is likely to use this process intensively. Second, U.S. steel labor costs continue to be high relative to other major steel-producing countries, especially in the Third World. Achieving international competitiveness will require modernization to be pursued aggressively in the United States to attain higher levels of technical efficiency and lower unit costs of production on a par with other countries.

I. THE DECLINE OF STEEL DEMAND

The current dismal outlook for American steel and steel industries worldwide results from long-term changes in the market for steel, coupled with the cyclical downturn in economic activity in the 1981-82 recession. Steel-intensity, the ratio of steel consumption per unit of Gross National Product (or Gross Domestic Product in most other countries), has fallen dramatically since at least the early 1970s. Products using steel as an input have changed in character, and other materials have emerged as a substitute for steel. Thus, steel demand has been on the decline throughout most of the world, as seen in the data of table 1, although it is expected to rise through the end of the 1980s, in large part a result of economic recovery and positive assumptions about intermediate term economic growth.

In general, the industrial countries of North America, Western Europe, and Japan experienced negative or very slow growth in demand throughout most of the 1970s. All were projected to have sharply falling rates of growth of steel demand from 1979 to 1983. Throughout the rest of the 1980s, steel demand in these countries is projected to grow at rates ranging from 0.2 percent in the United Kingdom to 6.3 percent in Italy. Even with these higher projected growth rates of steel demand for the rest of the decade, the fact is that steel demand

TABLE 1. Growth Rates of Steel Demand in Selected Countries, 1972 - 1990 a/
(percentages)

Country	1972 - 1979	1979 - 1983	1983 - 1990
United States	0.3	-7.0	3.8
Belgium-Luxembourg	-2.8	-3.9	1.9
Canada	2.3	-8.3	5.5
France	-2.0	-6.5	2.8
Germany	-1.1	-7.9	4.2
Italy	1.4	-5.7	6.3
Japan	0.9	-5.0	4.3
Netherlands	-2.1	-2.6	0.9
United Kingdom	-1.6	-9.3	0.2
Brazil	8.0	-6.0	6.3
Mexico	10.1	-0.6	5.4
Korea	25.8	3.1	6.7
Taiwan	22.0	11.3	7.6

Calculated by CRS, using as source: Chase Econometrics. The World Steel Outlook to 1995. Volume I. July 1983.

in many cases will not recover to even 1972 levels. For example, on a crude steel equivalent basis 3/, U.S. steel demand in 1990 is expected to be 2.4 million tons less than in 1972; in Belgium-Luxembourg, demand will be 1.1 million tons less than in 1972; and, in Germany, 5.2 million tons less than in 1972. Only in Canada, Italy, and Japan, among these industrial countries, is demand expected to rise above their 1972 levels.

The Third World countries identified in table 1 -- Brazil, Mexico, Korea, and Taiwan -- all exhibited strong rates of growth in steel demand throughout most of the 1970s. Only Brazil had a growth rate of less than 10 percent from 1972 to 1979. Korea and Taiwan each had rates of growth greater than 20 percent per year in this period. Thus, even Brazil had a rate of growth of steel demand

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3/ Crude steel equivalency is measured in terms of the amount of molten steel required to produce the volume of finished products demanded.

nearly four times that of Canada, the fastest growing of the industrial countries identified in the table. In part, these higher rates of growth are the result of rapid economic growth in these countries. For example, real GDP in Brazil and Mexico grew at annual rates of about 7.9 and 8.9 percent, respectively, and the economies of Korea and Taiwan expanded at annual rates of about 9 to 11 percent. By contrast, the U.S. economy grew at an annual rate of about 3.2 percent. 4/

From 1979 through 1983, steel demand fell sharply in all of the major industrial countries, and either fell or grew at much reduced rates in Third World countries. In the United Kingdom, demand for steel fell at a rate of 9.3 percent per year in this period, and, in the United States, at an annual rate of 7 percent. Brazilian demand for steel fell sharply at a rate of 6 percent per year, approximating the decline in the industrial countries. Still, Korea and Taiwan experienced rising domestic demand, and Mexico's demand, while falling, declined at a modest rate of less than 1 percent.

Steel demand for the rest of the 1980s is projected to increase in all the major steel-producing countries. In the industrial countries, the estimates of growth vary widely, from 0.2 percent per year in the United Kingdom to 6.3 percent in Italy; U.S. steel demand is projected to grow at an annual rate of 3.8 percent. In the Third World countries, steel demand is expected to grow at generally much higher rates than in the industrial countries, from 5.4 percent per year in Mexico to 7.6 percent in Taiwan. In effect, the positive growth in steel demand in this period represents for the industrial countries a recovery from the disastrous downturn in economic recovery in 1981-1982. While the economies of Third World countries also suffered in the first years of the 1980s, their growth in steel demand reflects both the recovery from the world-wide

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4/ All projections are based on data compiled by Chase Econometrics. The World Steel Outlook to 1995. Volume I. July 1983. (Hereafter referred to as Chase Econometrics.)

recession of 1981-1982 and their long-term growth to industrial maturity. Unlike the industrial countries, and if the projections of steel demand are realized, these countries will consume considerably more steel in 1990 as in 1972. Brazil would consume about twice as much steel in 1990 as in 1972; Mexico, nearly three times as much; Korea, about ten times as much; and, Taiwan, about ten times as much as in 1972.

Thus, the steel industry has assumed different roles in the industrial and the developing countries. In the industrial countries, steel has and is likely to maintain a posture of industrial maturity, characterized as providing a base for economic activity, but not one that will be at the leading edge of economic growth. In the Third World countries, seeking to achieve the status of industrial countries, steel has and is likely to continue to assume the role of a leading growth sector.

One aspect of this role of the steel industry in Third World countries is that its growth has been, and is likely to be, fueled by exports. Although steel demand is growing within these countries, their exports of steel, mainly to the industrial countries, is expected to grow even faster than their domestic demand. From 1980, the first year for which consistent data are available, to 1983, Brazil and Mexico experienced growth in steel exports at annual rates of 6.3 percent and 5.4 percent, respectively, even though their domestic demand for steel was falling. Taiwan's steel exports grew at a rate of about 7.6 percent, or more than three times the growth of its domestic steel demand in this period. Only Korea had a higher growth rate of domestic demand than of exports from 1980 to 1983; Korea's domestic demand grew at an annual rate of 11.3 percent as compared with a 6.7 percent growth rate in its steel exports. Indeed, the low growth rate of exports in this period may indicate that Korea was already dependent on export markets, its growth of exports reflecting the falling demand

TABLE 2. Growth Rates of Steel Demand and Exports and the Export Share of Total Steel Production of Selected Third World Countries, 1980 - 1990 (percentages)

Country	Steel Demand 1980-83	Steel Demand 1983-90	Steel Exports 1980-83	Steel Exports 1983-90	Export Share 1980	Export Share 1983	Export Share 1990
Brazil	-11.0	27.5	6.3	9.6	15.3	35.4	40.2
Mexico	-6.5	34.6	5.4	8.5	2.2	6.4	7.9
South Korea	11.3	0.1	6.7	15.4	63.1	46.1	58.3
Taiwan	2.2	10.6	7.6	12.1	27.6	26.2	29.1

Calculated by CRS, using as source: Chase Econometrics. The World Steel Outlook to 1995. Volume I. July 1983.

for steel in industrial countries. From 1983 to 1990, the growth of steel exports from these countries is projected to exceed by a substantial margin the growth of domestic demand for steel. These data are presented in table 2.

It is in this context of growth in demand for steel projected to be slow at best, in virtually all industrial countries, and of aggressive expansion of steel industries in Third World countries both at home and in export markets, that concern over the future of the steel industries in major industrial countries has arisen. On the one hand, the slow growth of steel demand in industrial countries may discourage investment in their steel industries. Further, investment in steel production could also be discouraged by penetration of their markets by the emerging steel industries in Third World countries. On the other hand, adjusting to a smaller market could stimulate investment to upgrade and modernize steel production of industrial countries in the face of increased competition. Such investment would not necessarily lead to an expansion of steel-making capacity; rather, it would probably result in more efficiency in the production of a smaller amount of steel in the more competitive environment of the world steel industry.

II. RATIONALIZATION OF AMERICA'S STEEL INDUSTRY TO MEET FOREIGN COMPETITION

America's steel industry has been restructuring itself for some time to meet the challenges of a smaller domestic market and the emergence of increased competition from foreign steel. Indeed, the traditionally major steel producing countries of Western Europe and Japan have been undergoing similar changes. This restructuring has taken the forms of rationalizing older and, perhaps, obsolete steel-making capacity and the expansion of new processes to more efficiently produce smaller quantities of steel.

(a) Rationalization of Open-Hearth Capacity in the American Steel Industry

The U.S. steel industry has experienced declining capacity to produce steel in recent years. Some industry observers point to this fall in production capability as evidence that America's steel industry is a declining industry. 5/ Upon closer examination, it appears evident that the industry has simply been modernizing by rationalizing its capacity: America's steel industry is, and has been, consolidating its capacity into a smaller number of more cost-effective facilities, while eliminating inefficient and obsolete steelmaking capacity. 6/

Steel-making capacity in the United States declined by a total of 22 million tons since 1979, or by about 12.8 percent, from 172 million tons in 1979 to about

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5/ See, for example, P.W. Marshall. Prepared Statement of Testimony of Dr. Paul W. Marshall Before the House of Representatives Subcommittee on Oversight and Investigation of the Committee on Energy and Commerce. March 22, 1982. in, U.S. Congress. House. Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce. Capital Formation and Industrial Policy. Hearings, 97th Cong., 2nd Sess. Part 3, March 22 - April 26, 1982. Washington, U.S. Govt. Print. Off., 1982. p. 107 f. W.T. Hogan, S.J. World Steel in the 1980s: A Case of Survival. Lexington, Lexington Books, 1983. p. 91 f. R.W. Crandall. The U.S. Steel Industry: Policy Options in a Competitive World. Washington, The Brookings Institution, 1981. p. 151 f.

6/ U.S. Library of Congress, Congressional Research Service. The Changing Composition of U.S. Steel-Making Capacity. Report No. 83-68 E, by David J. Cantor, Washington, 1983. 26 p.

150 million tons in 1983 (based on estimates made by the International Iron and Steel Institute and Chase Econometrics). 7/ This reduction in capacity accounts for about 54 percent of the worldwide decline of 40 million tons in steel-making capability over the same period, and for about 47 percent of the 47 million ton drop in the capacity in the non-Communist countries. Very simply, while the United States is responsible for a significant portion of this decline, the reduction in open-hearth capacity is not peculiar to the United States. Table 3 provides steel-making capacity data for major stelmaking countries and world regions for 1979 and 1983.

The main reason for this drop in American and world steel-making capability is that steel industries everywhere were eliminating their obsolete and inefficient open-hearth furnace capacity, as seen in the data of table 4. These furnaces accounted for nearly 22 percent of the world's steel-making capability in 1980, the last year for which consistent data across all countries are available, or for about 255 million tons. By 1983, open-hearth furnaces worldwide could produce about 197 million tons of crude steel, or about 18 percent of the world's total steel-making capacity. In the non-Communist world, open-hearth capacity totaled nearly 70 million tons in 1980, and nearly 35 million tons in 1983. Thus, worldwide, open-hearth capacity fell by 58 million tons, or by 23 percent; in the non-Communist world, this drop amounted to 35 million tons, or by about 50 percent.

The United States contributed most among the non-Communist countries to the rationalization of open-hearth furnace capacity. U.S. open-hearth capability stood at about 20.5 million tons in 1980, and at 11.4 million tons in 1983. Thus, it fell by over 9 million tons from 1980 to 1983, or by about 45 percent.

7/ Chase Econometrics. The data used and published by Chase Econometrics are those compiled by the International Iron and Steel Institute.

TABLE 3. World Steel-Making Capacity by Region and Country, 1979 and 1983.
(million short tons)

Region and Country	1979	1983 a/
North America	192.10	171.62
United States	172.00	149.93
Canada	20.10	21.69
Western Europe	296.14	258.55
Belgium-Luxembourg	35.73	27.94
France	38.72	32.09
Germany	77.00	66.19
Italy	42.84	42.74
Netherlands	8.41	8.38
Spain	16.74	17.82
Sweden	7.82	7.85
United Kingdom	39.61	26.70
Other Western Europe	29.27	28.84
Latin America	44.58	48.61
Brazil	19.05	22.25
Mexico	11.64	11.20
Other Latin America	13.89	15.16
Asia b/	211.27	218.92
India	16.20	17.75
Japan	176.42	175.58
South Korea	9.61	13.51
Taiwan	5.28	6.82
Other Asia	3.76	5.26
Africa	17.42	17.72
South Africa	13.13	12.42
Other Africa	4.29	5.30
Oceania c/	11.77	8.86
Communist Countries	382.36	388.09
Middle East	4.92	7.29
Total	1160.58	1119.66

a/ Estimated by Chase Econometrics.

b/ Includes only non-Communist Asian countries.

c/ Includes Australia and New Zealand.

Source: Chase Econometrics. The World Steel Outlook to 1995. Volume I. July 1983.

Although this reduction in U.S. open-hearth capacity is impressive, it should be noted that these furnaces still accounted for 7.6 percent of total U.S. steel-making capability in 1983, a far greater share of capacity than most other non-Communist countries.

The evidence, presented in table 4, shows that most other countries in the non-Communist world reduced their open-hearth capacity at a relatively faster pace than did the steel industry of the United States. All open-hearth capability in Belgium and Luxembourg was eliminated in this period, as were those furnaces in the United Kingdom, Oceania (Australia and New Zealand), and Africa. Japan, the Netherlands, and Taiwan had no open-hearth furnaces to begin with in 1980. Nearly 90 percent of Germany's open-hearth furnaces were closed down from 1980 to 1983, and more than 50 percent of France's. Thus, it is evident that all major steel-producing countries and regions were rationalizing their most inefficient capacity quite rapidlv, and that, although the United States was eliminating this capacity quite rapidly, it lags behind others in its pace of rationalization of open-hearth furnaces.

(b) Rationalization of America's Basic Oxygen Steel-Making Capacity

America's steel industry also reduced its capacity in basic oxygen furnaces. From 1980 to 1983, basic oxygen furnace (BOF) capacity was reduced by about 8 million tons in the United States, from 96.5 million tons in 1980 to about 88.6 million tons in 1983. This fall represents a percentage decline in BOF capability of about 8.2 percent. Although BOF is the most modern steel-making process in fully integrated steel mills, and the process which essentially replaced open-hearth furnaces, it is not a new process. It has been in use in the United States for nearly 30 years. 8/ The older BOF capability is relatively

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8/ Hogan, William T., S.J. Economic History of the Iron and Steel Industry in the United States. Volume 4: Part VI. Lexington, Lexington Books, 1971. p. 1452.

TABLE 4. Steel-Making Capacity by Process by Region and Country, 1980 and 1983
(million short tons)

Region and Country	1980 Open-Hearth	1980 Basic Oxygen	1980 Electric Furnace	1983 a/ Open-Hearth	1983 a/ Basic Oxygen	1983 a/ Electric Furnace
North America	24.44	108.61	52.05	14.20	101.55	55.87
United States	20.52	96.51	46.48	11.38	88.58	49.97
Canada	3.92	12.10	5.57	2.82	12.97	5.90
Western Europe	18.77	196.90	65.80	6.56	185.63	66.40
Belgium-Luxembourg	0.76	29.53	0.84	0.00	26.77	1.18
France	2.11	30.41	5.01	1.11	26.32	4.67
Germany	7.86	57.66	7.84	0.99	56.18	9.03
Italy	0.76	21.17	20.16	0.12	21.35	21.28
Netherlands	0.00	8.01	0.40	0.00	8.01	0.37
Spain	1.12	7.84	7.84	1.03	8.16	8.62
Sweden	0.52	3.77	3.36	0.45	4.10	3.30
United Kingdom	1.12	22.40	11.54	0.00	18.26	8.44
Other Western Europe	4.52	16.11	8.81	2.86	16.48	9.51
Latin America	11.29	20.38	14.46	5.69	25.23	17.70
Brazil	4.22	11.20	4.48	1.34	15.89	5.02
Mexico	2.31	5.38	4.08	1.55	5.38	4.28
Other Latin America	4.76	3.80	5.90	2.80	3.96	8.40
Asia b/	9.08	159.67	43.82	7.46	164.50	46.94
India	8.59	4.61	2.48	7.11	7.58	3.05
Japan	0.00	145.62	31.58	0.00	141.90	33.68
South Korea	0.13	7.17	3.32	0.13	9.97	3.40
Taiwan	0.00	2.02	3.26	0.00	3.64	3.18
Other Asia	0.36	0.25	3.18	0.22	1.41	3.63
Africa	1.79	10.83	5.29	0.34	11.95	5.44
Oceania c/	3.81	7.39	0.57	0.00	8.06	0.80
Communist Countries	184.92	153.05	52.06	161.93	170.16	56.00
Middle East	0.56	2.07	2.34	0.49	3.47	3.33
Total	254.66	658.90	236.29	196.67	670.55	252.47

a/ Estimated by Chase Econometrics.

b/ Includes only non-Communist Asian countries.

c/ Includes Australia and New Zealand.

Source: Chase Econometrics. The World Steel Outlook to 1995. Volume I. July 1983.

inefficient, considering that it does not embody the technological advances made to this process. 9/

The United States was not alone, however, in reducing its BOF capacity. Many of the European steel producers and Japan also eliminated relatively large amounts of their BOF steel-making capability. Belgium and Luxembourg reduced their BOF capacity by nearly 3 million tons, or by 9.4 percent. France's BOF capacity fell by more than 4 million tons, or by 13.4 percent. Japan's reduction in BOF capacity was nearly 4 million tons, or 2.6 percent of its 1980 capability.

BOF capacity worldwide rose, however, by about 12 million tons, or 1.7 percent. In 1980, there were about 659 million tons of BOF capability, and nearly 671 million tons in 1983. This increase occured in the Communist countries, where 17 million tons were added, and in Third World countries, where about 13 million tons of new BOF capacity were installed since 1980.

Thus, the steel producers of Western Europe, the United States and Japan appear to have been rationalizing their older BOF furnaces, in response to the prospect of slow growth in demand. The Communist countries apparently have been pursuing a course of replacing large amounts of open-hearth capacity with BOF. The Third World countries, which had relatively little BOF capacity until recently, have expanded the use of this process significantly, possibly in order to enter and establish a significant position in the world market for steel. Chase Econometrics observes that countries, like Taiwan, had a relatively large amount of electric furnace capacity to serve their small internal markets. 10/ These countries, as they aggressively expand exports of steel, are also building

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9/ Barnett, Donald F. and Louis Schorsch. Steel: Upheaval in a Basic Industry. Cambridge, Ballinger Publishing Company, 1983. p. 157 f.

10/ Chase Econometrics. p. 55 f.

up their BOF capacity to be able to produce a full range of steel products, something that is currently beyond the capability of the electric furnace.

III. MODERNIZATION OF AMERICA'S STEEL INDUSTRY

America's steel industry is shrinking in size, but its modernization is not predicated solely on the elimination of outmoded capacity. Total capability for producing steel in the United States has declined, a result of its smaller market, but the American steel industry has been the world leader in the use of electric furnaces, and is rapidly catching up with Europe and Japan with respect to the use of continuous casters. Also, America's steel industry is making significant progress in other technologies to improve quality and yield from existing steel-making capacity. Thus, modernization of America's steel industry is largely a two-pronged process of capital-widening and capital-deepening, an ongoing modernization that permits the industry to produce the same or smaller quantities of steel more efficiently than in the past.

(a) Expansion of Electric Furnace Capacity in the United States

America's steel-making capability, while declining overall, has been enhanced by the proliferation of the most widely-used and newest steel-making process, the electric furnace. Indeed, in the non-Communist world, the United States has the largest amount of electric furnace capability among all countries. U.S. electric capacity had grown by about two-thirds in the years from 1972 to 1982, according to data compiled by Data Resources, Incorporated (DRI). 11/ The Chase Econometrics projections, which are based on sources other than those used by DRI, shows U.S. electric furnace capacity growing by about 3.5 million tons, or a total of 7.5 percent, from 1980 to 1983.

11/ U.S. Library of Congress, Congressional Research Service. The Changing Composition of U.S. Steel-Making Capacity. p. 8.

The growth of U.S. electric furnace capability is explained by two main factors. First, it is more efficient than the BOF process, because it uses only scrap as a basic raw material input, and, thus, the stages of production of iron-making and sintering (the recovery of pure iron ore from ore-bearing earth) are eliminated. Second, it has emerged in regions of the country where economic growth has been relatively rapid. 12/ The growth of U.S. electric furnace capacity has supported the process of rationalization of older open-hearth and BOF capability. In addition, it has accommodated shifts of economic activity among regions within the United States.

Electric furnaces, it should be noted, do have limitations. The current state of technology limits them to only a narrow range of products, mainly those used in construction. 13/ In part, this is due to the fact that this process is scrap-based, and there are problems in controlling the quality of the scrap used in these furnaces. Limited to a narrow range of products, they typically are of small size. Indeed, this gives rise to the practice of referring to them as "mini-mills", when they are the only furnaces operated in a mill.

Electric furnace capacity has grown elsewhere in the world. Some 16 million tons of this capacity have been installed throughout the world from 1980 to 1983. As noted, the United States accounts for about one-fifth of this increase. Japan expanded this capability by about 2 million tons, or one-eighth of the total increase. Germany installed about 1.2 million tons

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12/ U.S. Library of Congress, Congressional Research Service. Regional Aspects of Shifts in the Steel Industry of The United States. Report No. 83-217 E, by Charlotte Breckenridge and David J. Cantor. Washington, 1983. p. 17 f.

13/ Crandall, Robert W. The U.S. Steel Industry in Recurrent Crisis. p. 14.

of electric capacity, or 7.5 percent of the world increase. The Communist countries increased their electric capability by nearly 4 million tons, or one-fourth of the total.

That electric furnaces may be the most efficient way to produce raw steel has not resulted in its universal acceptance. The United Kingdom reduced its electric capability by about 3 million tons, or by more than one-fourth of its capacity in 1980. Similarly, France reduced its electric capacity by about 9 percent of its 1980 stock. Its expansion in Third World countries has been relatively small. Korea expanded electric furnace capability by 180,000 tons, as contrasted with a nearly 3-million ton increase in BOF capacity. Similarly, Brazil, whose BOF capability grew by nearly 5 million tons since 1980, installed only 540,000 tons of electric furnace capability. Indeed, among Third World countries and regions, only the Middle East and Latin America (other than Brazil and Mexico) had any significant expansion of this process; in each region, electric capacity grew by about one million tons.

The mixed pattern of acceptance of electric capacity in steel-making can be explained by the fact that, although the process may be technologically superior to BOF, it may not satisfy economic criteria. As observed, these furnaces have been used to satisfy the demand for steel in relatively small markets and for a narrow range of products. Also, they depend on the availability of scrap metal as a basic raw material. Thus, if both the market size and range of product demand increases, and if the scrap were to become scarce relative to the demand for it, the economics of electric furnace capacity may be unfavorable. Similarly, if, as in countries like the United Kingdom, the market is shrinking, the use of the possible excess capacity of large integrated mills may be more efficient in an economic sense than electric furnaces.

Essentially, what has to be compared is the cost of production of steel in both BOF and electric furnaces; economies of scale and capacity utilization rates may render BOF plants more economic than the electric furnace, which is technologically superior in eliminating various stages in the production of steel and with respect to energy and total labor input. 14/

(b) Expansion of Continuous Casting in the American Steel Industry

If America's steel industry is able to produce less steel than in years past owing to reduced capacity, this does not mean that it cannot produce steel products more efficiently. Continuous casters, which permit the molten metal to be processed into semifinished shapes without first being cast into ingots, has come into wide use throughout the world as a technology which achieves major efficiencies in steel production. While other countries have installed this technology earlier and at a more rapid pace than in the United States, the evidence indicates that America's steel industry is moving rapidly to close this technological gap.

Most analysts allege that the U.S. industry is backward with respect to the use of continuous casting by pointing to the higher shares of continuously cast output of raw steel in other countries. There is no question, but that the U.S. industry is far behind in this regard. Nevertheless, in recent years, America's steel industry has accelerated the use of continuous casting, and has one of the highest rates of growth of output produced using this technology.

14/ Barnett and Schorsch point out that unit costs of production in an integrated BOF plant decline 28.5 percent, when the plant operating rate increases from 1 to 4 million tons. In mini-mills, increasing the operating rate by a factor of four would reduce unit costs by 18.5 percent. Still, Barnett and Schorsch argue that, to the extent that mills can be specialized and are not limited in the range of products, mini-mills do have significant capital-saving advantages over integrated plants. See, Barnett, D.F. and L. Schorsch. Steel: Upheaval in a Basic Industry. p. 193 f.

Data for 1979, 1981, and 1983 showing the volume of continuously cast output, their shares of total output, and their annual rates of growth for 14 major steel-producing countries are presented in table 5. These three years are in a relative sense years of peak or growing production. Thus, the distortions resulting from the selection of a trough year in the business cycle are reduced.

Over the entire period from 1979 to 1983, the U.S. steel industry's output of continuously cast steel increased by over 3 million tons, and grew at an annual rate of 3.4 percent. Its share of total output rose from 16.9 percent to 26.3 percent. Among the 14 countries, the U.S. ranked eighth in terms of the rate of growth, exceeded by Korea, Taiwan, Brazil, Canada, the United Kingdom, Spain, and France. The growth of continuously cast output of the U.S. industry was faster, however, than several major industrial countries -- Belgium-Luxembourg, Germany, Italy, and Japan.

From 1981 to 1983, however, America's steel industry ranked fifth among these countries in terms of the rate of growth of continuously cast output. Indeed, it had a positive rate of growth of continuously cast output, when most other countries had negative growth rates. In this period, the U.S. industry's growth rate was 1.9 percent per year, exceeded by Taiwan (26.4 percent), Brazil (7.6 percent), Spain (2.5 percent), and Korea (2.5 percent). All of the other countries, with the exception of the Netherlands, had negative rates of growth of continuously cast output. In general, then, only the emerging Third World countries had higher rates of growth of continuously cast output than the United States since 1981.

In addition, it is noteworthy that this period was one of rapidly declining production owing to the recession of 1982. Nevertheless, the United States was expanding its use of continuous casting, while most industrial countries were

TABLE 5. Continuous Casting in Selected Steel-Producing Countries: Output, Share of Total Production, and Growth Rates of Output, 1979 - 1983. (million short tons and percentages)

	1979		1981		1983 a/		Growth Rates:	
Country	Output	Share	Output	Share	Output	Share	1979-83	1981-83
Industrial Countries								
United States	23.33	16.9	25.70	21.1	26.67	26.3	3.39	1.86
Belgium-Luxembourg	3.54	17.2	4.51	25.1	4.02	30.3	3.23	-5.62
Canada	3.60	20.0	5.34	32.2	5.34	35.3	7.87	-4.52
France	7.85	30.0	12.22	51.3	9.21	51.4	4.08	-13.18
Germany	20.11	39.0	24.98	53.6	21.42	55.8	1.59	-7.39
Italy	12.49	46.0	14.10	50.8	13.24	53.8	1.46	-3.10
Japan	65.08	52.0	80.52	70.7	68.14	66.3	1.15	-8.01
Netherlands	0.00	0.0	1.30	21.2	1.32	25.9	N/M	0.80
Spain	4.39	32.0	5.27	36.4	5.53	41.7	5.94	2.50
United Kingdom	4.07	16.9	5.54	31.8	5.49	35.1	7.75	-0.49
Third World Countries								
Brazil	4.36	28.0	5.38	36.4	6.22	40.3	15.11	7.56
Mexico	2.39	30.0	2.35	27.6	2.07	30.7	-3.51	-6.19
South Korea	2.61	30.6	5.33	44.3	5.60	42.5	21.04	2.49
Taiwan	1.60	44.9	2.08	58.8	3.33	61.1	20.06	26.43

N/M: not meaningful.

a/ Estimated by Chase Econometrics.

Calculated by CRS using as source material: Chase Econometrics. The World Steel Outlook to 1995. Volume I. July 1983.

cutting back in the use of this process. The recession, therefore, had relatively little impact on the use of this technology as compared with other major steel-producing countries.

It should be kept in mind that, despite the technical benefits of the process, continuous casters are not easily modified to produce different semifinished shapes than those for which they were originally designed. 15/ The shapes for which they were designed depend on the finished product fabricated from them; for example, sheet products would be normally processed from slab. Thus, if demand declines for finished products produced from continuously cast semifinished shapes, it is likely that the continuous casters would not be used to their full potential. The falling rate of continuously cast output in most of these countries since 1981 may be explained by the relative inflexibility in the use of this process.

These data indicate that the United States is moving relatively quickly in adopting this process. Indeed, there is evidence that its adoption is accelerating rapidly. In 1983, Wheeling-Pittsburgh Steel opened two large continuous casters; in 1983 or early 1984, both Jones & Laughlin and Republic Steel put three continuous casters into operation; and Bethlehem Steel announced that it was beginning the construction of two casters. 16/

One difficulty in bringing these casters on line quickly is the relatively long construction period required to install the technology. In general, a large continuous caster is installed and made operational only after a period

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15/ U.S. Congress. Senate. Committee on the Judiciary. The Domestic Steel Industry and the Antitrust Laws. Hearings, 98th Cong., 2nd Sess., July 1, 1983. Washington, U.S. Govt. Print. Off., 1983. p. 152.

16/ Bennett, Keith W. J & L's New Casters Rolled Out Early. Iron Age, v. 227, January 16, 1984. p. 60 f. Weimer, George A. Republic Unveils Its New Caster. v. 227, February 6, 1984. p. 31 f. Pond, James B. Jumbo Bloom Caster Means Better Rails. Iron Age. v. 227, February 20, 1984. p. 67 f.

of about two years. This long gestation period may explain the high growth rate of U.S. continuously cast output; that is, it is in the period of the late 1970s that the U.S. industry committed itself to investing in continuous casting on a large scale.

While the U.S. steel industry shows every indication of "catching-up" with other major and emerging steel producing countries in the use of continuous casters, there may be limits to expansion. Charles Bradford, a steel industry analyst with Merrill Lynch, observes that the large number of small plants (as distinguished from firms) in the U.S. steel industry may limit the installation of continuous casters. Bradford states, " Much of the best and most usable of the new technology is inherently inflexible and not usable in small integrated plants." 17/ Also, specialialized products, which require added labor for inspection, grinding, and other processing, may not lend themselves to production from continuously cast semifinished steel. 18/ Thus, while this process has many advantages, it may not be suitable for all plants or processes.

Although these problems may limit the expansion of continuous casting in U.S. steel plants, the acceleration in the use of continuous casting in the United States is enabling the industry to overcome the technical advantages that other countries have had in recent years vis-a-vis America's industry. That other countries are not expanding their use of continuous casting as fast as the United States is due, in part, to their having approached their limits

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17/ Bradford, Charles A. Testimony of Charles A. Bradford. U.S. Congress. Senate. Committee on the Judiciary. The Domestic Steel Industry and the Antitrust Laws. Hearings, 98th Cong., 2nd Sess., July 1, 1983. Washington, U.S. Govt. Print. Off., 1983. p. 156.

18/ Barnett, D.F. and L. Schorsch. Steel: Upheaval in a Basic Industry. p. 127.

in the use of this process. America's steel industry has not, however, slowed down adoption of this technology; to the contrary, it continues to expand its use.

(c) Other Technological Changes in American and World Steel Industries

Continuous casting is but one technological change taking place in the steel industries of the United States and elsewhere. Ladle refining, which refines steel in the ladle rather than the smelting furnace, is being actively pursued by many American steel firms. Furthermore, more attention is being given to quality control generally. These developments have the potential to increase productivity by improving yield and to enhance efficiency by reducing the rejection rate of steel products by their users. Thus, while the American steel industry may produce smaller quantities of steel in the future, implementing these changes implies cost reductions in steel and, therefore, a more competitive environment.

Several American steel producers are actively engaged in improving metal or ladle refining techniques at the steel furnace. Inland Steel has used such techniques since the early 1970s; United States Steel Corporation is installing a ladle system at its Fairfield, Alabama plant, and has a refining system in place at its Baytown, Texas facility; Armco's Ashland, Kentucky plant put a ladle refining system into operation in 1983. 19/ There are a number of different systems available, and no one of them is acknowledged to be superior to the others. The American industry is adopting such measures to achieve economies and competitiveness with the rest of the world.

19/ McManus, George. Ladle Metallurgy Moves To A More Active State. Iron Age, v. 227, March 19, 1984. p. 30 f.

Less dramatic, perhaps, than innovation in steel-making, but nonetheless significant, are changes involving the use of so-called "high technology" to improve quality control. While not being ignored in the United States, quality control has become a major thrust of many foreign steel producers. Nippon Steel and Kobe Steel, two major Japanese producers, use optical and electronic devices to monitor quality. Similarly, laser technology is being used in West Germany to identify defective products. 20/ Robotics are employed at U.S. plants in certain processes. 21/ Several companies -- among them, National Intergroup, Bethlehem, and Armco -- are engaged in major research programs to develop strip casting techniques. 22/ Thus, as in the case of continuous casting and ladle technology, steel producers may not have or want the capacity to produce more steel, but they are developing and using new technologies to produce a better product.

IV. CONCLUDING OBSERVATIONS

The data reveal clearly that steel-makers in this country have made much progress to modernize their plant. In part, this has been done by ridding themselves of obsolete capacity. In part, it has been done by adopting new and proven technologies to increase productivity and quality. The industry clearly cannot rest on its recent progress, however, because foreign steel industries also are innovating in steel-making to accomplish the same purpose as the U.S. industry.

20/ Harvey, Robert E. Quality Is Job One For Steelmakers Overseas. Iron Age, v. 227, March 5, 1984. p. 30 f.

21/ Senia, Al M. Robots Take The Strain and Pain Out of Work at Kaiser. Iron Age, v. 226, November 25, 1983. p. 71 f.

22/ McManus, George J. Casting Thin Strip. Iron Age, v. 227, April 2, 1984. p 53 f.

The progress towards modernization of America's steel industry notwithstanding, there are two and related practices in the steel industry which are disquieting to many analysts. First, as discussed previously, the steel sector continues to include large amounts of outmoded open-hearth capacity in its physical plant. Second, and perhaps more importantly, the industry tends to utilize open-hearth furnaces at high rates and on a par with more advanced steel-making processes.

In 1983, more than 7.5 percent of America's steel-making capacity consisted of open-hearth furnaces; more than 11.4 million tons of this capability were in place in 1983, according to Chase Econometrics projections. More important, by 1990, there would still be about 5.6 million tons of open-hearth capacity in the United States, which would account for about 3.8 percent of total U.S. steel-making capability. Indeed, Chase projects that open-hearth capability will be a part of total capacity until 1994. 23/ Certainly, inefficient open-hearth furnaces, which require nearly two-thirds more labor than the more modern BOF furnaces, are being phased-out, but, apparently, only in a gradual way. 24/ Unlike the steel industry in other countries, which have eliminated virtually all of their open-hearth capacity, America's steel industry continues to use this capacity, thereby raising its average cost of production relative to costs in other countries.

The second and, perhaps, more important issue is that American steelmakers utilize open-hearth furnaces at a high rate. In 1980, utilization of this process was at a rate of 64.6 percent as compared to a rate of 71.2 percent for basic oxygen furnaces. In 1981 and 1982, the open-hearth utili-

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23/ Chase Econometrics. p. 171.

24/ U.S. Library of Congress, Congressional Research Service. The Changing Composition of U.S. Steel-Making Capacity. p. 19 f.

zation rate was greater than the overall average of all types of furnaces. In 1981, open-hearth furnaces operated at a rate of 79.5 percent of capacity as compared with an overall average rate of 74.9 percent. In 1982, the rate of capacity utilization of open-hearth furnaces was 54.6 percent as compared with an overall rate of 49.2 percent. Furthermore, according to Chase projections, in 1993, the last year in which open-hearth furnaces are projected to be a part of America's steel-making capacity, this process would be operated at a rate of nearly 88 percent, or slightly below the overall rate of 89.5 percent estimated for that year. 25/ What is especially disquieting about these rates of open-hearth capacity utilization is that virtually no other country utilizes this process so much. Other countries not only are ridding themselves of open-hearth furnaces at a faster rate than the United States, but they tend to use their remaining open-hearth capacity to handle only peaks in demand, thereby controlling more closely their production costs. The high utilization rates in the United States suggest that open-hearth furnaces are operated on a regular basis, and not to satisfy unusual peaks in demand; this practice exposes the industry to a competitive cost disadvantage in relation to other steel-producing countries.

In addition to the relatively slow pace at which open-hearth furnaces are being eliminated and the industry's tendency to utilize this capacity intensively, America's steel industry faces the problem of high labor costs relative to those in other countries. Total labor costs per hour in the United States' steel industry were $21.73 in 1983; in Japan, they were $10.87; in Europe, they ranged from $8.00 to $12; in Brazil and Korea, they were about $2.00. 26/

25/ Chase Econometrics. p. 171.

26/ U.S. Library of Congress, Congressional Research Service. Employment Compensation in the U.S. Steel Industry: Problems and Prospects. Report No. 84-580 E, by Richard S. Belous. Washington, 1984. 19 p.

To the extent that increases in labor costs cannot be contained, and/or that total labor input cannot be reduced, the steel industries of other countries could have a decided cost advantage over America's steel industry.

While the retention and use of open-hearth capacity are matters of concern, because they reflect a hesitancy to abandon outmoded practices, it is still apparent that the industry as a whole has been progressively upgrading its overall plant to be able to produce better quality steel more efficiently. The trend is to eliminate obsolete plant; it is simply not as rapid as some might favor. Clearly, the expansion of electric furnaces, continuous casting, and other new technologies augurs well for the U.S. industry as it catches up with the state-of-the-art steel industries of other countries.

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EMPLOYMENT IN THE STEEL INDUSTRY: THE SHAPE OF CHANGE

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ABSTRACT

Modernization of the U.S. steel industry means a permanently reduced workforce, increasingly composed of more educated and skilled workers performing non-routine tasks, which are less susceptible to encroachment by new technologies. Employment security among current workers is tenuous as they will need to adapt their skills to those required by the new, automated steelmaking processes in order to retain their jobs. For dislocated steelworkers, prospects of finding new jobs that offer comparable earnings and benefits are dim. The one bright note for steelworkers is that most job losses are likely to already have occurred, so that the next 10 years should be less traumatic than were the early 1980s.

EMPLOYMENT IN THE STEEL INDUSTRY: THE SHAPE OF CHANGE

INTRODUCTION

The domestic steel industry -- buffeted by structural forces and cyclical swings -- has become one of the leading examples of what is commonly referred to as a declining industry. Between 1947 and 1983, steel output rose at an average rate of 0.7 percent per year. 1/ In the 1980s, a worldwide recession, expansion of other nations' steel capacity, and the increasing supply of comparatively low-cost foreign steel to the U.S. market combined to depress domestic steel output by 12.3 percent per year on average. Similarly, the periodic post-war decline in employment among the industry's blue-collar factory workers, at an annual average rate of 1.4 percent, became a precipitous decline in the 1980s, at 14.5 percent annually.

To turn this situation around, U.S. steel producers have sought ways to make themselves more competitive with foreign producers. They have permanently shut down operations and closed entire plants that they deemed to be inefficient. Management and labor have negotiated cost-saving collective bargaining agreements. Steelmakers have introduced new technologies to make their facilities more productive. These actions contributed to the 1980s' upturn in output per hour for production workers to 3.1 percent annually. 2/ In contrast, over the

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1/ U.S. Bureau of Labor Statistics. Unpublished data.

2/ Ibid.

entire post-war period, productivity growth in steel averaged 2.0 percent per year among production workers.

Although productivity gains should help the domestic steel industry improve its competitive position in the international marketplace, it is unlikely that the United States' share of world steel production will grow sufficiently to spur a similar recovery in industry employment. Most observers agree that increases in U.S. steel output will not be accompanied by comparable expansion of the steel workforce. 3/ Instead, various studies indicate that the overall size of the steel workforce will continue its downward course due, in part, to technology-induced productivity gains.

Because the effect of technological change is not uniform across occupations, the job mix and skills required of the steel workforce will change at the same time that total employment is declining. The more pervasive use of current technologies, and the introduction of new technologies as they are developed, will promote expansion and contraction of different jobs at various times. 4/ The nature of jobs will be altered, as well, by the adoption of new technologies: the worker as monitor of a computer-directed production process, for example, is likely to become increasingly commonplace; the worker as direct participant on

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3/ National Research Council. The Competitive Status of the U.S. Steel Industry. Washington, National Academy Press, 1985. p. 134; Personick, Valerie. The Outlook Through 1995: Industry Output and Employment Projections. Monthly Labor Review, November 1983. p. 33; U.S. Congressional Budget Office. The Effects of Import Quotas on the Steel Industry. Washington, U.S. Govt. Print. Off., 1984. p. 44; U.S. Library of Congress. Congressional Research Service. The Outlook for Steel, 1983-1986: An Analysis Based on the Data Resources, Inc. Interindustry Model Projections. Report No. 83-590 E, by David J. Cantor. Washington, 1983. p. 7-8.

4/ For an analysis of the relationship between occupational employment and computer-based technologies across all manufacturing industries see U.S. Office of Technology Assessment. Computerized Manufacturing Automation: Employment, Education, and the Workplace. Washington, U.S. Govt. Print. Office., 1984. p. 101-148.

the factory floor, actively involved with the machine producing the output, is likely to become an increasingly rare sight.

In addition to examining the overall employment trends in the steel industry, the following analysis will focus on how the composition of the steel workforce has changed to date and is likely to change in the years to come. The effect of the industry's modernization on steelworkers -- both those laid-off and those still employed -- also will be addressed. Options to ease worker adjustment as the steel industry strives to recover will be presented, as well.

I. THE SHAPE OF CHANGE, 1977-1980

The 1977-1980 period provides a good base from which to assess the recent experience of the steel industry. In 1977, both output and employment were increasing as the economy recovered from the deep recession of the mid-1970s; in 1980, the two measures began decreasing as the economy entered a recessionary period. During these years, the industry had begun to restructure and modernize its operations. Two companies went bankrupt; some plants and operations were shut down; and integrated steel companies reduced capacity by about 14 million tons. 5/ A falling share of U.S. steel output was being produced in open hearth furnaces, while a rising share was being produced in basic oxygen and electric furnaces. Continuous casters were being more widely used in these years, as well. In both 1977 and 1980, the U.S. Bureau of Labor Statistics (BLS) conducted surveys of the blast furnaces and basic steel products industry (Standard Industrial Classification 331) which provide detailed information on its occupational structure.

5/ Hogan, William T. Steel in the United States: Restructuring to Compete. Lexington, Mass., Lexington Books, 1984. p. 9-94, 107, 125-126.

A. Employment by Occupation

As shown by the data in table 1, employment changes experienced by steelworkers between 1977 and 1980 varied across major occupational groups. Despite their job losses, blue-collar workers managed to maintain their four-fifths share of total industry employment. At the same time, the proportion of white-collar jobs edged up slightly because they experienced relatively smaller cutbacks (5.2 percent, or 5,000 jobs) compared to blue-collar workers (8.2 percent, or 36,800 jobs).

Some employees actually were added to the industry's payroll as others were being laid off. For example, the number of computer specialists grew by 400, or 22.2 percent, during the period. Growth was particularly rapid among systems analysts. The ranks of engineers also expanded by 400, or 4.7 percent. Industrial and electrical engineers made especially large relative job gains. (See appendix table for information on detailed occupational employment.)

On the other hand, blue-collar steelworkers in many of the less skilled occupations lost their jobs. Technological advances enabled machines to perform the tasks involved in some operatives' jobs. The encroachment of robots partly is reflected in the 4,300 job cutback among welders and flamecutters, which represented about one-fourth of their number in 1977, and in the 100-job cutback among production painters, which reduced their ranks by one-fifth in just 3 years. Similarly, the technological innovation permitting numerical rather than manual control of machine tools probably contributed to the loss of 1,600 jobs (or 9.9 percent) among machine tool operators. Jobs in the fairly low-skilled occupational group of laborers also fell substantially, down by 16,400 (or 17.0 percent) in 1980 compared to 1977.

Those helped or hurt by modernization cannot be strictly categorized along white-collar or blue-collar lines, however. One white-collar occupation within the engineering and science technicians' group -- drafters -- experienced cutbacks as its duties were increasingly taken over by computer-aided design technology. At the end of the period, there were 300 (or 17.6 percent) fewer drafters. The number of clerical jobs also declined, partly due to the growing pervasiveness of office automation. By 1980, there were 5,900 (or 12.1 percent) fewer clerical workers than in 1977.

Among blue-collar occupations, the data suggest that some of the more skilled workers may have benefitted from the steel industry's greater use of new technologies. One might expect the demand for mechanics, repairers, and installers to rise as new machines are put into use and require maintenance. Indeed, in 1980, there were 7,000 (or 17.7 percent) more mechanics, repairers, and installers in the steel workforce than in 1977.

B. Employment-to-Output Relationship

Another way to look at the evolving occupational structure of the steel industry explicitly takes into account the changing relationship between employment and output. Expressed in terms of workers per million tons of steel produced, the data in table 2 illustrate the industry's growing reliance upon more highly trained and skilled workers who perform non-routine tasks -- both in white-collar and blue-collar occupations — and its decreasing dependence upon workers whose job duties are susceptible to assumption by new technologies.

In 1980, there were 80 engineers employed per million tons of U.S. steel produced, up from 69 engineers in 1977. Some 67 engineering and science technicians were associated with each million tons of steel in 1980 compared to 57 technicians 4 years earlier. There were 417 mechanics, repairers, and installers employed per million tons of steel produced in 1980 as against 316 in 1977. In each of these occupations, the employment-to-output ratio increased at rates

Table 1. Employment by Occupation in the Steel Industry
Actual and Projected
(Employment in thousands)

	Actual a/		Projected b/
Occupation	1977	1980	1995
Total, all occupations	554.3	511.9	355.8 - 433.4
White-collar occupations	95.6	90.6	63.7 - 77.6
Professional, technical, and related occupations	28.2	27.7	19.2 - 23.4
Engineers	8.6	9.0	6.4 - 7.9
Engineering and science technicians	7.2	7.5	4.6 - 5.6
Computer specialists	1.8	2.2	1.7 - 2.1
All other	10.6	9.0	6.5 - 7.7
Managers, officials, and proprietors	15.9	16.1	12.0 - 14.6
Sales occupations	3.0	4.1	2.6 - 3.2
Clerical occupations	48.6	42.7	29.9 - 36.4
Blue-collar occupations	447.0	410.2	284.5 - 346.5
Craft and related occupations	191.3	193.7	136.3 - 166.0
Construction occupations	27.0	29.0	20.3 - 24.7
Mechanics, repairers, and installers	39.6	46.6	33.5 - 40.8
Metalworking crafts, excl. mechanics	30.0	31.9	22.4 - 27.3
All other	94.7	86.1	60.1 - 73.2
Operative occupations	159.3	136.6	93.9 - 114.4
Assemblers	1.2	1.0	0.7 - 0.9
Metalworking operatives	47.6	45.7	31.7 - 38.7
Packing and inspective operatives	5.2	3.0	2.1 - 2.6
Painters, production	0.5	0.4	0.2 - 0.3
Sawyers, metal	1.8	1.1	0.8 - 1.0
Transportation equipment operatives	17.3	17.9	12.5 - 15.2
All other	85.8	67.6	45.9 - 55.9
Laborers, excluding farm	96.4	80.0	54.3 - 66.1
Service occupations	11.7	11.1	7.7 - 9.4

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a/ Derived by applying the occupational staffing patterns for SIC 331 from BLS' Occupational Employment Surveys in 1977 and 1980 to actual industry employment in the 2 years.

(continued)

Table 1. Employment by Occupation in the Steel Industry
Actual and Projected -- Continued

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b/ Derived by applying BLS' staffing pattern for SIC 331 projected to 1995 to a) Data Resources, Inc.'s (DRI's) projected 1995 employment in blast furnaces and steel mills; electrometallurgical products; steel wire and related products; cold finishing, steel shapes; and steel pipe and tubes, and to b) BLS' projected 1995 employment in blast furnaces and basic steel products. The low-end of the range shown above is based upon employment growth rates from DRI's Interindustry Forecast, April 1985 (unpublished). The high-end of the range is based upon employment growth rates from BLS' low growth alternative, June 1984 (unpublished).

Source: Calculated by the U.S. Congressional Research Service based upon BLS and DRI data.

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more than four times the industry average (3.5 percent) over the 1977-1980 period.

In technology-susceptible occupations, the employment-to-output relationship declined. For example, semiskilled operative jobs dropped to 1,221 per million tons from 1,271 over the 1977-1980 period. Within the operative group, welders and flamecutters fell from 140 to 118 per million tons produced. Much less extensive use also was made of unskilled laborers, with each million tons of steel associated with 769 workers in 1977 compared to 715 by 1980.

II. THE SHAPE OF CHANGE, 1980-1995

As previously noted, analysts agree that U.S. steel employment will not return to its previous peak level. How far and how fast the drop in domestic steel employment is projected to be depends upon assumptions about the worldwide demand for steel products, the U.S. share of that demand, and the rate of productivity growth. Productivity growth, in turn, is related to the rate at which technological innovation is assumed to be introduced by steel producers, among other things. The future rate of technological change will depend upon the cost of the advanced technologies and the industry's ability to pay those costs.

Table 2. Employment-to-Output Relationship in the Steel Industry
Actual and Projected
(Workers Per Million Tons of Steel Produced)

	Actual a/		Projected b/
Occupation	1977	1980	1995
Total, all occupations	4,423	4,577	2,746 - 3,362
White-collar occupations	763	810	492 - 602
Professional, technical, and related occupations	224	248	148 - 182
Engineers	69	80	49 - 61
Engineering and science technicians	57	67	36 - 43
Computer specialists	14	20	13 - 16
All other	84	81	50 - 60
Managers, officials, and proprietors	127	144	93 - 113
Sales occupations	24	37	20 - 25
Clerical occupations	388	382	231 - 282
Blue-collar occupations	3,566	3,668	2,196 - 2,688
Craft and related occupations	1,526	1,732	1,052 - 1,288
Construction occupations	215	259	157 - 192
Mechanics, repairers, and installers	316	417	259 - 316
Metalworking crafts, excl. mechanics	239	285	173 - 212
All other	755	770	464 - 568
Operative occupations	1,271	1,221	725 - 887
Assemblers	10	9	5 - 7
Metalworking operatives	380	409	245 - 300
Packing and inspecting operatives	41	27	16 - 20
Painters, production	4	3	2 - 2
Sawyers, metal	14	10	6 - 8
Transporation equipment operatives	138	160	96 - 118
All other	685	604	354 - 434
Laborers, excluding farm	769	715	419 - 513
Service occupations	93	99	59 - 73

a/ Derived by dividing occupational employment data presented in table 1 by output data from the American Iron and Steel Institute.

b/ Derived by dividing occupational employment data presented in table 1 by projected output data developed from DRI and BLS models.

Source: Calculated by the U.S. Congressional Research Service.

A. The Future Size of the Steel Workforce

One estimate of the decline in steel employment, from 1980 to 1995, appea in tables 1 and 3. By 1995, total employment in the industry might fall to b tween 355,800 and 433,400 workers. Over the 15-year period, then, job loss could affect from 1.1 percent to 2.4 percent of steelworkers each year throug some combination of layoffs and attrition.

Based upon the actual experience of the industry from 1980 to 1984, the dat suggest that most of the job cutbacks might already have occurred. (See tabl 3.) The majority of obsolete facilities have been closed, and inefficient equipment has been or will likely be discarded or modernized by the late 1980s. 6/ Through the remainder of the period, then, steel employment might be fairly stable or rising moderately.

According to BLS data, steel employment dropped from about 511,900 in 1980 to 336,700 in 1984. While the economy has been recovering from the back-to-back recessions of 1980 and 1981-1982, steelworkers have continued to be displaced in significant numbers. Steel output, on the other hand, rebounded by nearly 15 percent between 1982 and 1983. If the 1980-1982 job losses reflected the industry's normal response to cyclically-reduced demand alone, one would expect the subsequent increase in output to have caused producers to recall some workers by 1984. 7/ Instead, they continued to let workers go, indicating that they have been adjusting to more long-run factors influencing the industry (e.g., import competition, excess capacity, product substitution) by permanently lessening labor requirements through shutdowns and automation.

6/ Hogan, Steel in the United States, p. 119 and 138.

7/ U.S. Congressional Budget Office. The Effects of Import Quotas on the Steel Industry. Washington, 1984. p. 19.

Table 3. Employment Change in the Steel Industry,
Actual and Projected

Employment (in thousands)

Actual a/			Projected b/
1977	1980	1984	1995
554.3	511.9	336.7	355.8 - 433.4

Employment Change (in thousands)

Actual a/		Projected b/	
1977-1980	1980-1984	1980-1995	1984-1995
(-42.4)	(-175.2)	(-78.5) - (-156.1)	(+19.1) - (+96.7)

Employment Change (compound annual average rate)

Actual a/		Projected b/	
1977-1980	1980-1984	1980-1995	1984-1995
(-2.6%)	(-9.9%)	(-1.1%) - (-2.4%)	(+0.3%) - (+1.6%)

a/ U.S. Bureau of Labor Statistics data.

b/ Projections from table 1.

Source: Calculated by the U.S. Congressional Research Service.

B. The Future Composition of the Steel Workforce

Both salaried and factory employees suffered severe cutbacks between 1980 and 1984. According to BLS data, there were about one-third fewer salaried (-38,000) and production (-137,000) workers in 1984 than in 1980. At Bethlehem

Steel alone, about 12,000 white-collar positions have been abolished since 1981. 8/

Some white-collar workers have been better able to weather the adjustment process to date, because demand for their skills has been increasing as the industry steps up modernization efforts. For example, the Granite City Steel plant of National Steel Corporation inaugurated a new phase of technological advancement in 1985 when it completed work on a hot strip mill computer. 9/ The company hired its own specialists capable of developing the computer system: five programmers worked for 2 years on setting up the computer-controlled production system. In addition, the company now has established an operations technology department composed of 20 people, including mechanical, electrical, chemical, and metallurgical engineers. They are charged with developing process improvements and quality controls, among other things.

The shift toward employment of relatively more skilled professional and technical workers may be slowing; however. After rising from 1.55 percent in 1977 to 1.75 percent in 1980, BLS estimates that engineers' share of industry jobs will grow at a more modest pace in the future, reaching 1.81 percent by 1995. Similarly, it is anticipated that computer specialists' proportion of total steel employment will grow more slowly than it has of late: in 1977, it measured 0.32 percent; by 1980, it stood at 0.43 percent; and by 1995 it may edge up to 0.49 percent.

With the recent acceleration of modernization efforts, much of the necessary technical expertise may already have been hired so that fairly stable or

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8/ Suddenly, the World Doesn't Care If You Live or Die. Business Week, February 4, 1985. p. 98.

9/ Congressional Record, Daily Edition, v. 135, April 24, 1985, p. S4716-4717.

slowly falling employment of professional and technical workers could well mark the remainder of the projection period. As shown in table 1, employment among these groups is projected to be lower in 1995 than in 1980 — despite their growing share of the workforce. Thus, the substantial demand-induced shrinkage in the industry's overall size to date is likely to swamp its growing reliance upon more educated and skilled workers.

Similarly, the more highly skilled blue-collar occupations that recorded expanded employment between 1977 and 1980 could well see their ranks diminish by the end of the projection period. As computed from the data in table 1, craftworkers were added to the industry payroll in the 1977-1980 period (0.4 percent per year, on average) while the less skilled blue-collar groups of operatives and laborers reported cutbacks (-5.0 and -6.0 percent annually, on average). Between 1980 and 1995, however, all three groups are projected to experience falling employment comparable to the industry's average rate of job contraction. 10/

For the two less skilled blue-collar categories this would represent a positive turn of events. That is, in 1977-1980, their rate of decline was about two or more times higher than the industry's annual average rate of -2.6 percent. For the skilled craftworkers, it might signal a lessening of their more favorable position compared to other blue-collar workers. For example, the mechanics, repairers, and installers group, which expanded by 5.6 percent annually between 1977 and 1980, is projected to contract by between 0.9 percent and 2.2 percent per year on average. Thus, the need to install and maintain automated equipment

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10/ As shown in table 3, the industry's annual average rate of employment change is estimated to range from -1.1 percent at the high-end of the projected job range (BLS) to -2.4 percent at the low-end of the range (DRI). For craftworkers, the range is projected to be from -1.0 percent to -2.3 percent; for operatives, from -1.2 percent to -2.5 percent; and for laborers, from -1.3 percent to -2.6 percent. See appendix table for absolute employment levels.

appears unlikely to forestall some cutbacks among these skilled workers. Although BLS anticipates that their share of total industry employment will continue to rise, from 7.14 percent in 1977 to 9.11 percent in 1980 to 9.42 percent in 1995, their total employment level will likely fall by the end of the projection period. Just as in the case of some professional and technical workers, the industry's growing reliance upon skilled blue-collar workers is apt to be overwhelmed by the substantially reduced demand for steel at the present time.

In summary, the data suggest that no occupation is likely to be immune to the adjustment process affecting the domestic steel industry. Differences in employment change by occupation between 1980 and 1995 will be more a matter of degree than direction. That is, some occupations requiring higher levels of education and skill could well have rates of employment decline somewhat below the industry's average rate, while other occupations whose duties are susceptible to encroachment by new technologies could well have rates of employment decline above the industry's average. The most positive conclusion to be drawn is that the massive layoffs which recently have plagued steel's workforce are likely near their end. Between the late 1980s and 1995, the continued restructuring and modernization of the steel industry probably will have a minimal effect on employment compared to the job losses already incurred.

III. THE PLIGHT OF STEELWORKERS

Both those workers who have been laid off from the steel industry with little likelihood of being recalled and those still employed at steel firms are being affected by the industry's dramatic shake up. For the two groups, it has meant a great blow to their job security. More specifically, for the laid-off workers, it has involved starting anew at a time in their working lives when change often is unwelcome and people are not best-equipped to handle it; for the presently-employed steelworkers, it has involved the prospect of learning to adapt to new equipment and practices. Neither the steelworkers nor their industry wanted this upheaval, but they -- along with their communities -- are trying to deal with it.

A. Dislocated Steelworkers

Other than what might be learned from anecdotal reports, definitive information on the characteristics and subsequent employment experience of dislocated steelworkers is sparse. The most comprehensive data is available from BLS' survey of workers who were laid off between January 1979 and January 1984 due to plant closings or relocations, slack work, or abolishment of positions or shifts. So that the survey could focus on unemployed workers who had had a firm attachment to their former jobs, BLS further narrowed its definition of dislocated workers to persons who were 20 years or older with at least 3 years job tenure. 11/

1. Their Reemployment Experience

The survey data indicate that some 120,000 steelworkers who lost their jobs between January 1979 and January 1984 fit BLS' dislocated worker definition. 12/

11/ The following analysis is based upon U.S. Department of Labor. Causes and Remedies for Displacement of Steel Workers. April 1985; U.S. Bureau of Labor Statistics. Press Release 84-492, November 30, 1984. (An example of a case study on the effect of mass layoffs at a particular steelmaker can be found in Steelworkers Research Project. Chicago Steelworkers: the Cost of Unemployment. Chicago, Health and Medicine Policy Research Group, 1985. 65 p.)

12/ In this tabulation, the steel industry includes blast furnaces, steelworks, and rolling and finishing mills.

Nearly two out of every three dislocated steelworkers were found to live in the Middle Atlantic and East North Central regions. Another one out of five lived in the West and East South Central regions. 13/ They most often were white married men, in their prime working years, with families. Typically, they had a high school education, and possessed skills as operatives. After averaging over 10 years at the job that they lost, they received unemployment insurance benefits for some part of their average 20-30 weeks of joblessness.

By January 1984, half of the dislocated steelworkers had found other jobs. Close to one-third remained unemployed, and nearly one-fifth had left the labor force. Among those aged 55-64, more than 1 out of 3 no longer were in the labor force. Although the data do not indicate why the workers withdrew from the labor force, it is likely that many of the older dislocated steelworkers opted for retirement rather than unemployment.

The subsequent employment experience of all dislocated workers and of those formerly working in other durable goods manufacturing industries was more favorable than that of dislocated steelworkers: their unemployment rate (about one-fourth were still jobless) and rate of labor force withdrawal (at 14 percent) were lower than those of dislocated steelworkers. Moreover, other dislocated workers experienced shorter average periods of joblessness. Consequently, they were less prone to exhaust their unemployment benefits than were dislocated steelworkers.

The reemployment of problems of dislocated steelworkers have been compounded by their geographic concentration, which has intensified competition for jobs

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13/ The Middle Atlantic region covers New Jersey, New York, and Pennsylvania. The East North Central region covers Illinois, Indiana, Michigan, Ohio, and Wisconsin. The West South Central region covers Arkansas, Louisiana, Oklahoma, and Texas. The East South Central region covers Alabama, Kentucky, Mississippi, and Tennessee.

available within a reasonable commuting radius. In addition, with the steel industry as the mainstay for some areas' economies, its downsizing has meant that there often are few alternative jobs in the localities for which the dislocated steelworkers can compete. Along with other dislocated workers, unemployed steelworkers share other barriers to reemployment, such as their inexperience in how to look for another job due to their long-time attachment to one firm, their general reluctance to relocate, and, in some instances, their age. 14/

Dislocated steelworkers fortunate enough to find new full-time jobs by January 1984 were less likely to be earning as much as they had previously compared to all dislocated workers and to those displaced from other durable goods manufacturing industries. 15/ Over half of dislocated steelworkers in full-time jobs were earning one-fifth or less of their former wages. In contrast, about one-quarter of all dislocated workers and one-third of dislocated workers from durable goods manufacturing industries reemployed in full-time jobs were bringing home paychecks equalling one-fifth or less of their previous earnings.

Thus, not only have dislocated steelworkers had a harder time finding new jobs, but they also have had a more difficult time getting jobs that pay close to their former earnings levels. Part of the reason lies with their above average wages which means few jobs in other industries offer similar earnings. For example, steelworkers averaged $13.00 an hour in 1984 compared to $9.72 an hour

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14/ For additional information on the reemployment handicaps of dislocated workers and on the subject of worker displacement in general see U.S. Congressional Budget Office. Dislocated Workers: Issues and Federal Options. Washington, U.S. Govt. Print. Off., 1982. 56 p.; U.S. Library of Congress. Congressional Research Service. Economic Growth and Changing Labor Markets: Those Left Behind: Dislocated Workers; An Analysis. Report No. 83-220 E, by Linda LeGrande. Washington, 1983. 33 p.

15/ In this tabulation, the steel industry includes blast furnaces, steelworks, rolling and finishing mills, and iron and steel foundries.

for factory workers in all durable goods manufacturing industries. Another contributing factor is that a portion of the unemployed steelworkers' former earnings reflects their industry-specific skills. Since the skills are not transferable to jobs in other industries, new employers will not compensate the former steelworkers for those skills. Similarly, to the extent that dislocated steelworkers' earnings were related to seniority rather than to their general skill level, it will make it more difficult for them to find new jobs offering comparable pay in other firms or industries because they will have to start at the bottom of the seniority ladder.

2. Worker Adjustment Assistance

> Ultimately, the vast majority will find new positions or retire. But, in many cases, disillusionment will accompany the new paycheck -- the result of abandoning former career goals, preferred hometowns, and the serene reliance on job security. These people are finding that things aren't necessarily getting better year after year . . . . For members of the U.S. middle class, that is tantamount to the death of the American Dream. 16/

As joblessness sharply increased in the early 1980s, there was just one Government program in operation that focused on dislocated workers -- the Trade Adjustment Assistance (TAA) program. It is directed at one subset of the dislocated worker population, namely those whose unemployment is related to import competition. Unless extended by Congress, the TAA program will expire at the end of this fiscal year.

Between April 1975 and the first half of 1984, the U.S. Department of Labor (DOL) received and processed over 1,200 petitions for assistance that involved workers from the steel industry -- with nearly 6 out of 10 submitted between

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16/ Suddenly the World Doesn't Care If You Live or Die, p. 98.

January 1979 and June 1984. 17/ Of these, about 350 petitions covering some 166,000 steelworkers were certified as eligible for assistance under the program in the past 9 years.

The TAA program offers income support (i.e., trade readjustment allowances) and adjustment services (e.g., job search help, training, relocation aid). Through June 30, 1984, the DOL paid over $383 million in trade readjustment allowances to more than 157,000 former steelworkers. 18/ As has been the case during the life of the TAA program, the level of income support payments dwarfed the amount of funds expended for job search assistance ($342,000 for 976 steelworkers) and relocation allowances ($1.3 million for 768 steelworkers).

DOL's Employment and Training Administration conducted a special survey of some 8,700 TAA participants from the steel industry who have entered training since October 1981. 19/ Most steelworkers who enrolled in training courses were in their prime working years (i.e., 25-44 years of age). About one-fourth of those who completed training obtained jobs related to their fields of training. Most often, the steelworkers were trained to be refrigeration/air conditioning repairers, welders, computer technicians, truck drivers, and mechanics (e.g., industrial maintenance and autos). Of those who did not complete their training, more than one-third returned to their former jobs and over one-fifth left due to financial problems.

Today, the major Government program serving dislocated workers is Title III of the Job Training Partnership Act (JTPA). Eligible persons can receive job

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17/ Causes and Remedies for Displacement of Steel Workers, p. 60-61. The steel industry includes carbon and alloy steel products.

18/ Ibid., p. 61

19/ Ibid.

search assistance, retraining, and relocation allowances. In contrast with TAA program, funds available for income support are very limited.

JTPA programs directed at dislocated steelworkers have been supported the Secretary of Labor's Title III reserved funds and the States' Title III al cations. 20/ Examples of projects funded from the national reserve account $1 million to Chicago's Office of Employment and Training for helping disloca steelworkers in the Chicago area; $1 million to Allegheny County's Department Federal Programs for assisting U.S. Steel Corporation workers in Allegheny Beaver Counties, Pennsylvania; $1.4 million to Utah's Office of Job Training Economic Development for aiding dislocated workers from Kennecott Copper Comp and U.S. Steel Corporation's Geneva Works; and $1.2 million to Pennsylvani Private Sector Initiatives Job Search Program for serving workers laid off f Crucible Steel who reside in Pennsylvania, Ohio, and West Virginia. Sta supported programs that cover dislocated steelworkers include $180,000 in Pueblo area of Colorado to serve dislocated workers from the CF&I steel pla $1.0 million in Lake and Porter Counties, Indiana, administered by the AFL- to assist workers in steel and related industries; and $143,000 in the Ashl area of Kentucky to help steelworkers from Amcast Steel, Armco Steel, Kentu Steel, and AFT.

Title VIII of the Trade and Tariff Act of 1984 is directed specifically the relationship between international trade, steel industry modernization, worker displacement. It states that, in return for the President's negotiat and continued enforcement of restraint agreements with steel-exporting natio the major U.S. steel producers must commit substantially all of their net c flow from steel operations to reinvestment in and modernization of the st

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20/ Ibid., appendix.

industry, and at least 1 percent of that amount must be devoted to worker retraining.

Under the Act, Congress directed the DOL to submit a plan proposing ways to assist workers in communities that are adversely affected by steel imports, including retraining and relocation of steelworkers unlikely to be recalled to their jobs. As part of the plan submitted in spring 1985, the DOL has established a steel adjustment project devoted to assisting dislocated steelworkers. 21/ The 3-part project involves: (1) a set-aside of $10 million from JTPA's Title III reserved funds, for training and employment services, conditional on States and localities providing a two-for-one match; (2) a Federal technical assistance team working with appropriate parties at all levels of government to assure timely development of projects that make full use of current knowledge to reemploy dislocated steelworkers; and (3) a task force, chaired by the Under Secretary of Labor and composed of representatives from labor, industry, and State and local governments, to assess current worker adjustment efforts and formulate ways to improve them.

To date, the DOL has announced that, subject to the matching requirement and approval of specific project proposals, 19 States are expected to receive the $10 million JTPA set-aside. 22/ The states are Alabama, California, Colorado, Illinois, Indiana, Kentucky, Maryland, Michigan, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, South Carolina, Texas, Utah, Washington, and West Virginia. It is anticipated that the programs should be in operation by midsummer 1985.

21/ Ibid., p. 81-82.

22/ Labor Department Grants $15 Million to Dislocated Workers in Steel, Copper. Daily Labor Report, June 3, 1985. p. A-16.

B. The Employed Steelworker

Although not in as precarious a position as the dislocated steelworker, those remaining in the steel workforce have lost some of the employment stability they once enjoyed. Their jobs may not have been eliminated by modernization, but rather, may now be changed by it. That is, their job classifications, the nature of the work assigned to them, and the skills required to perform their job duties are not as immutable as in the past.

1. Skill Upgrading

When people envision the modernized steel mill, they see a workplace involving production processes that put fewer physical demands on workers. 23/ Instead of being on a noisy plant floor, in direct physical contact with hot, hazardous materials, steel mill workers are seen as monitors or troubleshooters of electronically controlled manufacturing operations. The workers are pictured in control rooms, removed from the factory floor, but still responsible for what is occurring there by reading production-related information which appears on meters or visual display terminals. 24/

The skills required to monitor electronic controls and computers are different from those needed to tend steel furnaces. The former include technical capabilities, attentiveness, and verbal communication. 25/ The latter include

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23/ U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science Research and Technology; and Committee on the Budget. Task Force On Education and Employment. Technology and Employment. Hearings, 98th Cong., 1st sess. June 1983. Washington, U.S. Govt. Print. Off., 1983. p. 293.

24/ Ibid., p. 271.

25/ Ibid., p. 271-272.

such physical capabilities as strength, hand-eye coordination, and agility. The problem for currently employed steelworkers, then, is that these new skills do not appear to mesh well with those possessed by and formerly useful to them in performing their jobs.

One might argue that those who have invested many years with the same employer should be given a chance to try to make the transition from a more manual to a more automated industry. If the industry is being given some breathing room during which to modernize (i.e., the period of the export restraint agreements), as a matter of equity, should not the steelworkers be given time to adapt to their evolving conditions? Against this equity consideration, however, must be balanced a cost consideration: it would very likely be less expensive for steelmakers to displace current employees and then hire new workers already possessing the requisite skills who would start at the bottom of the seniority ladder. 26/

It appears that the Trade and Tariff Act of 1984 tries to strike a balance between the industry's needs and those of its workers. While giving steel producers a green light to modernize, Congress imposed an obligation on steel companies to be financially responsible for the outcome of their actions, i.e., to pay for retraining of workers permanently displaced by new technologies so that they are better prepared to find other employment. Taking this line of reasoning back one step, it might be argued that the industry's responsibility for modernization's effects begins before the worker is let go. 27/ Thus, the first step

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26/ In a survey of 322 senior human resource executives at Fortune 500 companies, it was found that the most often used strategy for dealing with skill obsolescence was hiring new employees with the requisite skills and the least preferred strategy was retraining employees for new positions. However, a positive association between the degree of technological change and use of retraining was suggested by the data. ITT Educational Service. America at Work: The Management Perspective on Training for Business. Washington, 1984. p. 9-11.

27/ Data from a survey of 1,821 companies' training activities (continued) in the worker adjustment process would involve efforts to upgrade the skills of current employees to enable them to remain on the payroll, and then only if that failed, would the second (permanent separation) and third (retraining for non-steel jobs) steps occur.

Whether workers' skills can be upgraded sufficiently to enable them to work with the new technologies is going to depend upon the characteristics of the individual employee and the extent to which skill requirements change. It may be highly improbable to transform a 50-year-old furnace operator who never completed high school into a programmer of computerized manufacturing equipment, for example. It is much more probable, however, that an industrial machinery or maintenance repairer can learn the necessary technical skills to advance from working on mechanical to working on electronic equipment. 28/

To the extent that skill upgrading is possible, it has benefits for steel producers, steelworkers, and society in general. Steelmakers would save on severance payments and supplemental unemployment benefits, for example. Steelworkers neither would have to undergo the trauma associated with joblessness nor lose seniority-related earnings and benefits. For society as a whole, there would be less of a drain on the unemployment insurance system as well as less of a strain on social services, among other things.

(continued) suggest that a minority (35.8 percent) of manufacturing firms retrain those workers whose jobs are phased out to perform substantially different jobs. Of all firms that do provide retraining, production workers are most likely to receive retraining. Retraining: Media Event or Workplace Reality? Training, October 1984. p. 46.

28/ Technology and Employment, p. 1234.

2. Other Options for Employment Security

Skill upgrading is just one possible method that permits change to occur in the workplace while minimizing the threat to the continued employment of the current workforce. Other measures sometimes mentioned toward the same end include job redesign and worksharing.

Because of the introduction of new technologies, the present configuration of job duties and relationships among job classifications may no longer be the most efficient. Greater employer flexibility in the assignment of job duties, for example, might facilitate worker productivity. Moreover, by broadening the scope of work that individuals could be asked to perform, their versatility and general skill level might be raised. This, in turn, could increase the importance of their role in the production process and thereby enhance their employment security. 29/ How best to accomplish job redesign so that management and labor benefit is going to be an important subject for collective bargaining.

Worksharing also offers the potential for maintaining employment in the face of reduced demand for labor. As in the case of job redesign, however, it is likely to be a difficult concept to implement. For example, Jones and Laughlin Steel Corporation and Steelworkers Local 1211 agreed to share jobs available to the labor pool among members of a rotating layoff group. 30/ Initially, the plant's labor pool was composed of two groups, one covering 220 employed workers and the other covering 205 laid-off workers. By merging the two groups, the available jobs were to be spread across 425 rather than 220 workers each of whom would rotate layoff periods of not more than 3 months. The arrangement was

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29/ Computerized Manufacturing Automation, p. 111-112 and 154.

30/ Work Sharing Continues at Steel Plant. Employment and Training Reporter, March 20, 1985. p. 850.

challenged in the U.S. District Court of Western Pennsylvania by both groups of workers. The employed members of the labor pool asserted that the union had violated its duty of fair representation and that the contract had been violated because the laid-off workers added to the labor pool possessed less seniority. The Court decided, however, that the union acted in the best interests of all its members by providing them with work when many were jobless and not receiving unemployment benefits. Resumption of work by the laid-off workers would enable them to regain eligibility for unemployment compensation, health insurance, and supplemental unemployment benefits, according to the Court, as well as to resume accumulating pension credits. Although the previously employed members of the labor pool would work fewer days as a consequence of the merger, the Court held that their lower earnings would be mitigated by their receipt of State and employer-provided unemployment benefits. Members of the laid-off group, who would have been able to retire early if their layoff period reached 2 years, challenged the agreement as well. The Court decided that the worksharing agreement is valid, despite its meaning that these workers would not be able to opt for early retirement.

While this form of worksharing requires labor-management negotiation, another version of the concept requires modification of State unemployment insurance laws. Often referred to as short-time compensation, its intent is to create a more equitable distribution of unemployment during temporary lulls in economic activity. It seeks to accomplish this by: (1) shortening the workweek of all workers in the affected unit, rather than allowing some to continue working full-time while temporarily laying off others. [illegible] then (2) permitting these workers to qualify for partial unemploym[illegible]at compensate them for their reduced worktime. A limited number [illegible]ding Arizona, California, Florida, Illinois, Maryland, Oregon, [illegible]) permit this variant of worksharing.

Under the Tax Equity and Fiscal Responsibility Act of 1982, Congress directed the DOL to develop model language for short-time-compensation programs which could be useful to State legislatures. 31/ In addition, the DOL is required to evaluate the impact of State programs and submit a report, with recommendations, to Congress by October 1, 1985.

IV. AFTERWORD

Steelworkers are one of the victims in the decline of the U.S. steel industry's international competitiveness. As imports have assumed a growing share of the world steel market, U.S. producers have laid off large numbers of workers. Steelmakers' efforts to reverse this trend and recoup some of their market share, however, will not result in a similar turnaround for its workforce -- because the restructuring and modernization that the industry's recovery entails means permanently fewer jobs.

For steelworkers, this has been an especially difficult reality to accept. They previously enjoyed years of job security, high pay, and good benefits. Once employed by a steelmaker, they knew what to expect and what was expected of them. Even when laid off during recessions, they would wait them out. They expected to be and were recalled once the economy and the steel industry went into a recovery cycle.

This time, the scenario is different. The economy has recouped its losses from the recessions of the 1980s; the steel industry has not. Workers in many industries have received word to return to their former jobs, but large numbers of steelworkers remain unemployed. And they are likely to remain unemployed if

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31/ Commerce Clearing House, Inc. Unemployment Insurance Reports, News Matters, August 23, 1983. p. 3936-3944.

they cling to the hope of recall by steel producers. The closing of entire plants, shutting down of some operations, and investment in new technologies means a downsizing of the industry — and to an even greater extent, of its workforce.

The altered situation faced by the steel workforce goes beyond a general contraction of its ranks to a change in its composition. That is, some workers have been hurt more than others because the cutbacks have hit occupations to differing degrees. Although all occupational groups have been adversely affected by job losses, those whose job duties are susceptible to assumption by new technologies have suffered relatively larger losses. The growing reliance of the industry on more educated and skilled workers has somewhat insulated them from the general contraction in steel.

The changing composition of the workforce has ongoing implications for dislocated and currently employed steelworkers. For dislocated steelworkers, it further lessens the likelihood of their resuming employment in the industry. That is, not only will the reduced demand for steel products keep them from being recalled, but also the different skills required by the modernized manufacturing process may prevent them from adapting their customary abilities to the new demands. Similarly, for currently employed steelworkers, their ability to remain in the workforce will depend, in part, upon how well the skills they possess and those now required mesh.

If the employment projections are fairly accurate, at least as rough indicators of general directions and magnitudes, then the number of steel jobs may already have bottomed out. Between the late 1980s and 1995, employment is likely to be somewhat stable or slowly expanding. As just noted, however, job growth will not be sufficiently large or in the occupations needed to reemploy all former steelworkers.

With or without public and private efforts to assist them, the future for steelworkers is going to be difficult. For some, it may mean early retirement. For many more, it is likely to mean getting a new, lower-paying job either on their own or with the assistance of employer- or Government-supported programs. A change in job, then, will likely entail a change in their standard of living. (Those dislocated steelworkers with greater general education and skills should have a somewhat easier time finding other employment and at a wage rate closer to that of their former jobs.) Retraining may help the dislocated steelworker increase the probability of reemployment, but not necessarily at a comparable wage or in the same geographic area. A new job, then, may entail adjusting to a new community, removed from their support network of friends and family. Analogously, skill upgrading for currently employed steelworkers may provide them with the opportunity to adapt to new job requirements, but it does not guarantee employment security. Such stability, which may be promoted by job redesign or work-sharing, is not apt to be the prevalent characteristic of the steel workforce that it was in earlier years.

APPENDIX

Table A. Employment by Detailed Occupation in the Steel Industry
Actual and Projected
(Employment in thousands)

	Actual a/		Projected b/
	1977	1980	1995
Total, all occupations	554.3	511.9	355.8 - 433.4
Professional, technical, and related occupations	28.2	27.7	19.2 - 23.4
Engineers	8.6	9.0	6.4 - 7.8
Civil	0.6	0.6	0.4 - 0.5
Electrical	0.8	1.1	0.7 - 0.9
Industrial	2.1	2.4	1.8 - 2.2
Mechanical	1.7	1.7	1.2 - 1.5
Metallurgical	2.0	1.9	1.4 - 1.7
Engineering and science technicians	7.2	7.5	4.6 - 5.6
Drafters	1.7	1.4	0.7 - 0.8
Electrical and electronic technicians	0.8	1.1	0.8 - 1.0
Industrial engineering technicians	1.3	0.9	0.6 - 0.8
Mechanical engineering technicians	0.2	0.2	0.1 - 0.2
Computer specialists	1.8	2.2	1.7 - 2.1
Computer programmers	0.8	0.9	0.6 - 0.8
Computer systems analysts	1.0	1.2	1.1 - 1.3
All other	10.6	9.0	6.5 - 7.7
Managers, officials, and proprietors	15.9	16.1	12.0 - 4.6
Sales occupations	3.0	4.1	2.6 - 3.2
Clerical occupations	48.6	42.7	29.9 - 36.4
Bookkeepers and accounting clerks	3.6	3.3	2.3 - 2.8
Clerical supervisors	1.8	1.9	1.4 - 1.6
File clerks	0.4	0.5	0.3 - 0.4
General clerks, office	3.9	3.9	2.7 - 3.3
Office machine operators	3.8	3.3	2.3 - 2.8
Computer operating personnel	2.8	2.6	1.8 - 2.2
Computer operators	0.9	0.8	0.6 - 0.7
Data entry/keypunch operators	1.6	1.6	1.1 - 1.3
Peripheral EDP equipment operators	0.3	0.2	0.1 - 0.2
Order clerks	0.9	1.1	0.8 - 1.0
Payroll and timekeeping clerks	1.8	1.8	1.2 - 1.5
Personnel clerks	0.7	0.8	0.5 - 0.7
Procurement clerks	0.4	0.5	0.4 - 0.4

(continued)

Table A. Employment by Detailed Occupation in the Steel Industry
Actual and Projected -- Continued
(Employment in thousands)

	Actual a/		Projected b/
	1977	1980	1995
Production clerks	6.4	5.4	3.8 - 4.6
Receptionists	0.2	0.2	0.1 - 0.1
Secretaries, stenographers, & typists	6.5	6.1	4.6 - 5.6
Secretaries	3.0	3.1	2.5 - 3.0
Stenographers	1.3	1.1	0.8 - 1.0
Typists	2.2	1.9	1.3 - 1.6
Shipping and receiving clerks	2.0	2.0	1.4 - 1.7
Shipping packers	1.9	1.5	1.1 - 1.3
Statistical clerks	1.0	0.9	0.5 - 0.6
Stock clerks, stockroom and warehouse	3.9	3.0	2.1 - 2.5
Switchboard operators/receptionists	0.4	0.4	0.3 - 0.3
Telephone operators	0.2	0.2	0.1 - 0.2
Weighers	1.3	0.8	0.6 - 0.7
Craft and related occupations	191.3	193.7	136.3 - 166.0
Construction occupations	27.0	29.0	20.3 - 24.7
Bricklayers and stonemasons	4.8	5.7	4.0 - 4.9
Carpenters	2.1	1.9	1.4 - 1.6
Electricians	12.8	13.7	9.5 - 1.6
Painters, construction & maintenance	1.1	0.9	0.6 - 0.7
Plumbers and pipefitters	4.8	5.6	3.9 - 4.8
Structural steelworkers	1.2	1.1	0.8 - 1.0
Mechanics, repairers, & installers	39.6	46.6	33.5 - 40.8
Air conditioning, heating, and refrigeration mechanics	0.4	0.4	0.3 - 0.3
Automotive mechanics	3.5	2.6	1.8 - 2.2
Computer service technicians	0.1	0.1	0.1 - 0.9
Industrial machinery repairers	15.0	17.6	12.6 - 15.4
Instrument repairers	1.9	2.1	1.5 - 1.9
Maintenance repairers, general utility	2.9	5.3	3.7 - 4.5
Millwrights	13.9	15.7	11.6 - 14.1
Radio and television repairers	0.4	0.4	0.2 - 0.3
Metalworking crafts, excluding mechanics	30.0	31.9	22.4 - 27.3
Blacksmiths	0.4	0.4	0.2 - 0.3
Boilmakers	2.3	2.3	1.4 - 1.7
Forging press operators	0.3	0.6	0.4 - 0.5
Heat treaters, annealers, & temperers	3.2	2.8	2.2 - 2.6
Machinists and layoff markers	7.9	8.8	6.2 - 7.5
Layout markers, metal	0.6	0.6	0.4 - 0.5
Machinists	7.4	8.2	5.8 - 7.0

(continued)

Table A. Employment by Detailed Occupation in the Steel Industry
Actual and Projected -- Continued
(Employment in thousands)

	Actual a/		Projected b/
	1977	1980	1995
Job and die setters	1.2	1.6	1.1 - 1.4
Machine tool setters, metal	0.3	0.4	0.2 - 0.3
Punch press setters, metal	0.1	0.3	0.2 - 0.3
Shear and slitter setters	0.8	0.7	0.5 - 0.6
Molders, metal	0.4	0.4	0.3 - 0.3
Rolling mill operators and helpers	7.7	8.8	6.2 - 7.5
Sheet metal workers and tinsmiths	0.7	0.6	0.4 - 0.5
Toolmakers and diemakers	1.1	0.9	0.6 - 0.8
All other	945.7	86.1	60.1 - 73.2
Blue-collar worker supervisors	37.2	37.3	27.5 - 33.5
Cabinetmakers	0.2	0.2	0.1 - 0.1
Crane, derrick, and hoist operators	23.8	26.2	18.3 - 22.3
Inspectors	9.4	8.1	5.6 - 6.8
Locomotive engineers	2.3	2.4	1.6 - 2.0
Stationary engineers	1.8	2.4	1.2 - 1.5
Testers	2.1	2.7	1.9 - 2.3
Operative occupations	159.3	136.6	93.9 - 114.4
Assemblers	1.2	1.0	0.7 - 0.9
Metalworking operatives	47.6	45.7	31.7 - 38.7
Dip platers, nonelectrolytic	0.6	1.1	0.8 - 1.0
Electroplaters	0.7	0.7	0.5 - 0.6
Furnace operators, cupola tenders	3.7	2.8	2.0 - 2.4
Heaters, metal	1.9	2.5	1.7 - 2.1
Machine tool operators	16.2	14.6	10.0 - 12.2
Drill press & boring machine operators	0.7	0.6	0.4 - 0.5
Grinding & abrading machine operators, metal	2.9	3.6	2.4 - 2.9
Lathe machine operators, metal	2.8	1.9	1.3 - 1.6
Machine tool operators, combination	1.5	0.8	0.6 - 0.7
Machine tool operators, tool room	0.3	0.7	0.5 - 0.6
Machine tool operators, numerical control	0.4	0.3	0.2 - 0.2
Milling & planing machine operators	0.7	0.6	0.4 - 0.5
Power brake/bending machine operators, metal	0.9	1.0	0.7 - 0.9
Punch press operators	1.2	0.8	0.6 - 0.7
Shear and slitter operators, manual	4.9	4.2	3.0 - 3.6
Pourers, metal	2.4	3.0	2.0 - 2.5
Welders and flamecutters	17.5	13.2	9.2 - 11.2
Packing and inspecting operatives	5.2	3.0	2.1 - 2.6
Production packagers	5.2	3.0	2.1 - 2.6

(continued)

Table A. Employment by Detailed Occupation in the Steel Industry
Actual and Projected -- Continued
(Employment in thousands)

	Actual a/		Projected b/
	1977	1980	1995
Painters, production	0.5	0.4	0.2 - 0.3
Sawyers, metal	1.8	1.1	0.8 - 1.0
Transportation equipment operatives	17.3	17.9	12.5 - 15.2
Chauffeurs	0.3	0.3	0.2 - 0.2
Industrial truck operators	9.8	10.2	7.2 - 8.7
Railroad brake operators	2.2	2.5	1.7 - 2.1
Truckdriving occupations	5.0	5.0	3.5 - 4.2
All other	84.5	66.5	45.9 - 55.9
Filers, grinders, buffers, & chippers	2.0	2.5	1.7 - 2.1
Furnace operators & tenders, except metal	0.8	0.8	0.5 - 0.7
Miscellaneous machine operators, primary metals	14.2	11.5	8.0 - 9.8
Miscellaneous machine operators, not elsewhere classified, durable goods	6.0	6.3	4.4 - 5.4
Mixing operators	1.1	0.8	0.5 - 0.7
Oilers	2.3	2.0	1.5 - 1.8
Sandblasters and shotblasters	0.5	0.6	0.4 - 0.5
Laborers, except farm	96.4	80.0	54.3 - 66.1
Conveyor operators and tenders	1.5	1.4	1.0 - 1.2
Furnace operators and heat helpers	3.2	2.8	2.0 - 2.4
Gardners and groundskeepers, except farm	0.2	0.2	0.2 - 0.2
Helpers, trades	9.3	8.9	6.2 - 7.6
Riggers	4.9	4.4	3.1 - 3.7
Shakeout workers, foundry	0.2	0.2	0.1 - 0.1
Order fillers	1.6	1.7	1.7 - 2.1
All other	75.4	60.4	40.0 - 48.8
Service workers	11.7	11.1	7.7 - 9.4
Building custodians	5.9	5.5	3.8 - 4.7
Food service workers	0.6	0.3	0.2 - 0.2
Selected health service workers	0.3	0.2	0.1 - 0.2
Protective service workers	4.0	4.4	3.1 - 3.7
Supervisors, nonworking, service	0.7	0.6	0.4 - 0.5

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a/ Derived by applying the occupational staffing pattern for SIC 331 from BLS' Occupational Employment Surveys in 1977 and 1980 to actual industry employment in the 2 years.

(continued)

Table A. Employment by Detailed Occupation in the Steel Industry
Actual and Projected -- Continued
(Employment in thousands)

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b/ Derived by applying BLS' staffing pattern for SIC 331 projected to 1995 to a) Data Resources, Inc.'s (DRI) projected 1995 employment in blast furnaces and steel mills; electrometallurgical products; steel wire and related products; cold finishing, steel shapes; and steel pipe and tubes, and to b) BLS' projected 1995 employment in blast furnaces and basic steel products. The low-end of the range shown above is based upon employment growth rates from DRI's Interindustry Forecast, April 1985 (unpublished). The high-end of the range is based upon employment growth rates from BLS' low growth alternative, June 1984 (unpublished).

Source: Calculated by the U.S. Congressional Research Service.

lhl/mls/jv

Mr. VOLKMER. Thank you very much, Dr. Cantor. Mr. Robins.

STATEMENT OF MR. NORMAN ROBINS, VICE PRESIDENT FOR TECHNOLOGICAL ASSESSMENT, INLAND STEEL CO., EAST CHICAGO, IN

Mr. ROBINS. Thank you very much, Mr. Chairman. My name is Norman A. Robins, vice president of technological assessment for Inland Steel Co. And as you mentioned, I am the chairman of the steering committee for the steel industry/Federal laboratories initiative, also known as the Keyworth initiative.

The Keyworth initiative is a proposed joint collaborative research program involving the national laboratories, the National Bureau of Standards and the steel industry.

My purpose today is to describe this initiative for you and try to answer any questions you may have about it. The initiative was instigated by Dr. G.A. Keyworth, Science Adviser to the President, and Howard M. Love, chairman of National Intergroup, when in a February 3, 1984, presentation to the Presidential Commission on Industrial Competitiveness, Mr. Love proposed, and I quote:

> That steel firms come together to identify an agenda for R&D on leapfrog technologies and then join with the national labs to realize that agenda. Let me stress that this must be R&D on leapfrog technologies. If we fall into the rut of business as usual and merely agree on a modest agenda of R&D for incremental improvements, we will have failed.
>
> Let's envision a steel industry where we throw away the blast furnace, throw away coke ovens, and develop entirely new ways of making a higher quality, higher yield product at smaller scales with greater flexibility and more automation.
>
> Let me also stress that by seeking a technological solution we are building upon our national strengths. We cannot compete with the Third World on the cost of labor or capital, but one thing we have in our favor is the best science and technology base in the world. Let us take advantage of the base, let us utilize it for the benefit of our basic industries.

Unquote from Mr. Love.

Five days later members of the American Iron and Steel Institute [AISI] Committee on General Research joined Mr. Love and Dr. Keyworth for a meeting in the White House to begin planning for the initiative. Shortly thereafter joint exploratory studies between national laboratories and steel industry scientists were underway.

By October of 1984, through the efforts of over 60 people from industry, from the Federal laboratories, and from universities, the program had been developed. I will describe it for you in just a moment but I want to say one word first about the status of the funding for the program.

As you know, a total of $14 million per year for 2 years is required for the first phase; $10 million per year from the Department of Energy for Argonne and Oak Ridge National Laboratories; $2.5 million per year from the Department of Commerce for the National Bureau of Standards; and $1.5 million per year from the steel industry to support 15 industry scientists who would work side by side with Government scientists at the national laboratories and the Bureau of Standards.

In November the AISI Board of Directors approved the industry share. But I should also point out that the industry will actually be contributing an additional $1.35 million per year for additional support required by the industry scientists, for executive supervisory personnel involved in the program administration and interaction with the Federal Government, and for proprietary technology that will be contributed by individual companies, which will make the total industry contribution close to $3 million per year.

After AISI Board approval, the proposed research program was submitted by OSTP [Office of Science and Technology Policy] to OMB [Office of Management and Budget], but as you know because of the budget reduction efforts, the funds were not included within the President's 1986 budget.

However, a few weeks ago your committee authorized $8.5 million for this program for DOE and DOC. And recently the Appropriations Committee restored the full funding and we are very grateful for both of these actions. Now, of course, we hope for full funding from the House, for which I certainly solicit your support, and then hope the Senate does likewise.

If I may digress 1 minute from what I have prepared, the idea of funding the national laboratories' effort through the Department of Energy of course makes eminent sense because the Department of Energy is basically responsible for the administration of Argonne and Oak Ridge National Laboratories. But there is one concern I think that we need to be aware of as we go through this, which is the fact that many people in the Department of Energy see their mission as solely related to energy efficiency. And the mission of this program, of course, goes beyond energy efficiency, although it would have a great implication for energy use in the steel industry. And I think it is just important that we keep that in focus as we go through this initiative so that we do not allow the initiative to get sidetracked from its overall purpose.

Now let me describe the program for you. There are two major tasks: (A) The direct production of liquid steel from domestic raw materials; and (B) continuous electromagnetic casting of liquid steel to near-net-shaped solids.

The principal objective of task (A) is to develop a coal-based process with a one-step reduction of iron ore directly to steel. The process sought would leapfrog existing technology by replacing the conventional coke oven, blast furnace and other steps.

Coal is preferred because of its inherent cost advantage and availability in the United States. And the process evaluation and development will emphasize the utilization of a wide range of domestic coals and iron ores as feedstocks.

The timeframe for this task is commercialization within 10 to 15 years. The ideal process should result in a 50-percent reduction in capital costs, and a 30-percent reduction in operating and maintenance costs as compared with present technology.

Another part of this objective is to find solutions to some generic problems that could prevent or impede commercial implementation of such a direct process. Two such problems are: First, excessive wear of refractories by high iron oxide slag; and second, cleaning particulate and gaseous sulfur from gases at high temperatures. Clearly, if progress is made in these areas, it could be applicable even in today's iron and steelmaking technology.

Another objective of this first task is to determine the feasibility of even more innovative direct iron- and steel-making technologies, such as: electrochemical refining, plasma processes, biomining and biorefining, and refining and smelting with iron-based solvents. It is hoped that one or more of these technologies will become commercially viable in the long term, 20 years or more.

The lead laboratory for this project will be Argonne, which has extensive capabilities in the development and analysis of a variety of technologies of similar scope such as magnetohydrodynamics, combined cycle coal gasfication and nuclear power systems; as well as technical expertise in such areas as fluid bed combustion, slag-refractory interactions, dirty gas cleanup and complex chemical process systems.

The primary objective of task (B) is to develop a moldless process for the continuous casting of near-net-shapes, such as strip, and the required additional thermal-mechanical processing after casting.

In the most promising approach for casting, we use an electromagnetic field to shape the liquid steel into the desired form for solidification. Argonne is the designated lead laboratory for this effort because of its extensive experience with magnets and magnetic devices, including superconducting magnets; and its expertise in electromagnetics and metallurgy.

The electromagnetic continuous casting process is expected to achieve a superior product, free of defects caused by molds, with minimal capital energy and operating costs.

Other parts of the work on casting include work on the removal of nonmetallic inclusions from liquid steel by filtration or by magnetic separation; and the development of sensors for online monitoring of key process variables such as the nonmetallic inclusion content and the position of the liquid-solid interface. These developments also could be applied in today's technology.

The work on the thermal-mechanical processing will seek to eliminate hot rolling during the processing of near-net-size cast strip to final product. Also, with the new technology that will result from this effort, it is hoped to obtain extensive changes in properties of steel within a single chemical composition by controlling the processing sequence. Oak Ridge will play the major role in this thermal-mechanical processing project because of its experience in the areas of metal casting and processing, study of relationships between material microstructure and properties and the development of new alloys. Oak Ridge has the facilities to conduct the needed processing and the latest analytical tools for microstructure evaluation.

In both tasks the National Bureau of Standards will have an essential input, in both sensor development and modelling work.

As you can see, the Keyworth initiative is a substantial undertaking with potential revolutionary impact on steel making. However, it must be emphasized that it is quite limited in scope relative to the overall research needs of the steel industry, and represents only those technological areas where efficient use can be made by the steel industry of the wide-ranging expertise of the national laboratories.

The project selection was based on three criteria. First, projects which, if successful, will lead to significant mid- and long-term improvement in the competitive position of the U.S. steel industry.

Second, projects for which the Federal laboratories, in particular Argonne and Oak Ridge, have a special, if not unique, combination of professional capabilities, facilities, and ideas.

I think these two points are very important, if I may digress for 1 minute again from my prepared testimony. That is that when we sat down to develop a program, we were not just trying to develop a program to find out how to apply money from the Federal Government or from elsewhere. We were looking for a combination of projects that would really mean something to the industry if they could be developed; and at the same time, were something that made sense for the national laboratories to work on. We did not just want to go in there with a series of problems—assign them a bunch of problems—and say, "now go to work." We really sat down and analyzed together what their strengths were and tried to develop those kinds of programs that would make particular use of those strengths, so that we really were using the national laboratories to their best advantage, not just because they happened to be there.

The third point in selection of projects was projects for which the aggregate funding requirements were consistent not only with Federal funds that might be available, but in particular with the manpower availability from the steel industry, because we felt all along that we could not just give an assignment to the national laboratories to carry out a project for us, then back away and come back 5 years later and see what they accomplished. The only way something relevant is going to come out of this work is with the industry and the labs working very closely together. And that requires that we have industry scientists working in the laboratories, helping to provide some direction in terms of the relevancy of the work.

And so we really cannot undertake anything that is bigger than we have the manpower to be able to apply to that effort to make sure that it goes right.

This completes my discussion on the Keyworth initiative. I have been asked to also address the interim technology that the industry must install in the near term if it is to remain competitive long enough to apply the results of the initiative, which I will do briefly.

The most obvious need is to complete the switch from ingot production to continuous casting. In the not too distant future there may be a further move to thin slab casting, although the efficacy of this approach to high quality cold rolled sheet production is not proven yet.

The second obvious need is to sharply increase the use of computers and automated processing throughout the steel plant. Meeting this need, however, is at least partially dependent on the development of appropriate sensors, an effort which, as Dr. Cantor mentioned, is the focus of several collaborative projects organized by the American Iron and Steel Institute.

The third need is to keep on installing the finishing processes that will be required to meet market needs, current examples being continuous annealing lines and electrogalvanizing lines.

Behind all of this, though, is to do whatever it takes to supply the market with higher quality steel at lower costs. Part of the answer to whether the steel industry will be here long enough to use the results of the Keyworth initiative is whether our customers will be here, or will they be offshore or using other materials.

We have to do what we can through providing more value to the customer to keep them here and using our steel. I can assure you the industry is dedicated to that end.

Thank you.

[The prepared statement of Mr. Robins follows:]

Statement by Norman A. Robins
Vice President, Technological Assessment, Inland Steel Company
Before the Subcommittee on Investigation and Oversight
of the House of Representatives Committee on Science and Technology
July 22, 1985

My name is Norman A. Robins, Vice President of Technological Assessment, Inland Steel Company. I am the Chairman of the Steering Committee for the Steel Industry/Federal Laboratories Initiative, also known as the Keyworth Initiative. The Keyworth Initiative is a proposed joint collaborative research program involving the National Laboratories, the National Bureau of Standards, and the steel industry. My purpose today is to describe this Initiative for you, and try to answer any questions you may have about it.

In May, 1983, the White House Science Council's Federal Laboratory Review Panel issued a report, known as the "Packard Report," which strongly recommended increasing the collaboration of the federal laboratories with universities and industry. Subsequently, Dr. G. A. Keyworth, Science Advisor to the President, and Howard M. Love, Chairman of National Intergroup, as members of the Presidential Committee on Industrial Competitiveness (PCIC), identified the possibility that this recommendation could be related to the long-range problems of the domestic steel industry. In a February 3, 1984, presentation to the PCIC, Mr. Love made the following suggestion:

> "What I am proposing, then, is that steel firms come together to identify an agenda for R & D on leapfrog technologies, and then join with the National Labs to realize that agenda. Let me stress that this must be R & D on leapfrog technologies. If we fall into the

rut of 'business-as usual,' and merely agree on a modest agenda on R & D for incremental improvements, we will have failed. Let's envision a steel industry where we throw away the blast furnaces, throw away coke ovens, and develop entirely new ways of making a higher quality, higher yield product, at smaller scales, with greater flexibility and more automation.

"Let me also stress that by seeking a technological solution, we are building upon our national strengths. We can't compete with the third world on the cost of labor or capital. The one thing we have in our favor is the best science and technology base in the world. Let's take advantage of the base; let's utilize it for the benefit of our basic industries."

Five days later, members of the AISI Committee on General Research joined Mr. Love and Dr. Keyworth for a meeting in the White House; and, shortly thereafter, joint exploratory studies between National Laboratories and steel industry scientists were underway. By October of 1984, through the efforts of over 60 people from industry, from the Federal Laboratories, and from universities, the program had been developed. I will describe it for you in just a moment, but first let me brief you on the status of funding for the program.

A total of $14 million/year for two years is required -- $10 million/year from the Department of Energy for Argonne and Oak Ridge, $2.5 million/year from the Department of Commerce for the National Bureau of Standards, and $1.5 million/year from the steel industry

(AISI) to support 15 industry scientists who would work side-by-side with government scientists at the National Laboratories and the Bureau of Standards.

In November, the AISI Board of Directors approved the industry share, with half the funds to come from the AISI budget and half from the individual participating companies. I should also point out, although it does not show in the formal work plan, that the industry will actually be putting substantially more than $1.5 million/year into this effort. We have estimated that, for additional support required for the industry scientists, for executive and supervisory personnel involved in program administration and interaction with the Federal Government, and for proprietary technology contributed by individual companies, the industry will be contributing an additional $1.35 million/year, making the total almost $3 million/year.

After AISI board approval, the proposed research program was submitted by the Office of Science and Technology Policy to the Office of Management and Budget for approval in December. Unfortunately, because of budget reduction efforts at OMB, no funds were included for DOE or DOC for this program in the 1986 budget. However, a few weeks ago, your Committee authorized $8.5 million for this program, and recently the Appropriations Subcommittees restored full funding. Thus, we now hope for full funding from the House (for which I certainly solicit your support), and then hope the Senate does likewise.

Now, let me tell you about the program. There are two major tasks: (A) direct production of liquid steel from domestic raw materials, and (B) continuous electromagnetic casting of liquid steel to near-net-shape solids.

The principal objective of Task A is to develop an optimized process for the direct carbo-thermal reduction of iron ore directly to steel. The process sought would leapfrog existing technology by replacing the conventional coke oven, blast furnace, and steelmaking steps. Coal is the preferred reductant in the process because of its inherent cost advantage over other fuels, and the process evaluation and development will emphasize the utilization of a wide range of domestic coals and iron ores as feedstocks. The time frame for this task is commercialization within the "mid-term," 10 to 15 years. The ideal process should result in a 50% reduction in capital costs and a 30% reduction in operating and maintenance costs, as compared with present technology.

A subordinate objective in this Task is to find solutions to some generic problems that could prevent or impede commercial implementation of such a direct process. Two such problems are (1) excessive wear of refractories in contact with high-iron oxide slags at temperatures of 1600° and (2) difficulty in eliminating entrained particulate and gaseous sulfur at temperatures of 800-1000°C.

Another objective of this Task is to determine the feasibility of even more innovative direct iron- and steelmaking technologies such as electrochemical refining, plasma processes, biomining and biorefining, and refining and smelting with iron-based solvents. It is hoped that one or more of the processes explored will become commercially viable in the long term (20 years or more).

The lead laboratory for this project will be Argonne, which has extensive capabilities in the development and analysis of a variety of technologies of similar scope, including magnetohydrodynamics, combined-cycle-coal gasification, and nuclear power systems; as well as technical expertise in such areas as fluidized-bed combustion, slag-refractory interactions, dirty gas cleanup, and complex chemical process systems.

The primary objective of Task B is to develop a "mold-less" process for the continuous casting of near net shapes, such as strip, and the required additional thermal-mechanical processing after casting. The most promising approach for casting will adapt electromagnetic containment, currently in use for casting of aluminum. Argonne is the designated lead laboratory for this effort, because of its extensive experience in the design, construction, and testing of state-of-the-art magnets and magnetic devices, including super-conducting magnets; and its expertise in electromagnetics and metallurgy. The electromagnetic continuous casting process is expected to achieve a superior product, free of defects caused by molds, with minimal capital, energy, and operating cost.

Subordinate objectives for this part of Task B include the investigation of potential methods for the removal of nonmetallic inclusions in steel melts, particularly filtration or magnetic separation, and the identification and development of sensors for on-line monitoring of key process variables, including the nonmetallic inclusion content of the molten steel and the position of the liquid/solid interface.

The key objective for the second part of Task B will address the development of a scientific basis for the use of thermal-mechanical processing for controlling the properties of steel, and will seek to eliminate hot rolling during the processing of near-net-size cast strip to final product. With the new technology that will result from this effort, it is hoped to obtain extensive changes in properties within a single chemical composition through control of the processing sequence. Oak Ridge will play the major role in this thermomechanical-processing project because of its experience in the areas of metal casting and processing, study of relationships between material microstructure and properties, and development of new alloys. Oak Ridge has the facilities to conduct the needed processing and the latest analytical tools for microstructre evaluation.

In both Tasks, the NBS will have an essential input in both sensor development and modeling.

In conclusion, it must be emphasized that, while the Keyworth Initiative is a substantial undertaking, with potential revolutionary impact on steelmaking, it is quite limited in scope relative to the overall research needs of the steel industry and represents only those technological areas where efficient use can be made by the steel industry of the wide-ranging expertise in the national laboratories. Their selection was based on three criteria:

1. Projects which, if successful, will lead to significant mid- and long-term improvements in the competitive position of the U.S. steel industry.

2. Projects for which the federal laboratories, in particular Argonne and Oak Ridge, have a special, if not unique, combination of professional capabilities, facilities, and ideas.

3. Projects for which the aggregate funding requirements are consistent with federal funds anticipated over the next few years, and manpower available from the steel industry.

That completes my discussion of the Keyworth Initiative. I have been asked to also address the interim technologies the industry must install in the near term if it's to remain competitive long enough to apply the results from the Initiative, which I will do, briefly.

The most obvious need is to complete the switch from ingot production to continuous casting. In the not-too-distant future, there may be a further move to thin slab casting, although the efficacy of this approach to high quality cold-rolled sheet production is not proven, yet.

A second obvious need is to sharply increase the use of computers and automated processing throughout the steel plant. Meeting this need, however, is at least partially dependent on the development of appropriate sensors, an effort which is the focus of several collaborative projects organized by the American Iron and Steel Institute.

A third need is to install the finishing processes required to meet market needs -- such as continuous annealing lines and electrogalvanizing lines.

Behind all of this, though, is to do what it takes to supply the market with higher quality steel at lower cost. Part of the answer to whether the steel industry will be here long enough to use the results of the Keyworth Initiative is whether our customers will be here -- or will they be off-shore, or using other materials. We have to do waht we can, through providing more value to the customer, to keep them here, using our steel. And I can assure you, we're dedicated to that end.

Mr. Volkmer. Thank you very much, Dr. Cantor, Mr. Robins. At this time we will go to questions by the panel. I would like to announce that I understand, Mr. Robins, you have a plane and you are going to have to leave. So we will begin with you with questions, even though we normally start the other way. And as soon as we have completed those, feel free to leave.

Mr. Robins. Thank you very much.

Mr. Volkmer. At this time I will recognize the gentleman from California for some questions that he may have.

Mr. Packard. Thank you, Mr. Chairman. Mr. Robins, how has the industry accepted and what has been their response to the President's program for the steel industry?

Mr. Robins. Is there a particular program that you are referring to or——

Mr. Packard. The Keyworth initiative, yes.

Mr. Robins. Well, the impetus of course for the program came from the Federal Government in the form of the Office of Science and Technology Policy. They were extremely instrumental in getting the effort organized and getting the national laboratories involved and interested in the project. After the program was developed and it came time to try to get the Federal Government's part in the funding for the project, OSTP retained their interest at least long enough to submit the program to the budgeting process through OMB. But in OMB it fell out of the budgeting process and, of course, there was nothing in the Federal budget proposed for the President by fiscal 1986 for the program. So at that point I guess you could say that the support dropped.

Mr. Packard. I believe it has been plugged back in, though.

Mr. Volkmer. Yes, he mentioned that. We have got it back in. We did not quite get all the Bureau of Standards money. The conference report, as I understand it, is $2 million even for the Bureau of Standards instead of $2.5 million. But I think there are sufficient funds that are going to be available.

Mr. Packard. The use of the proposed technology as a solution to the steel industry's problems is generally perceived to be a long-term solution. What do you see as short-term, intermediate processes that could be implemented or are being implemented?

Mr. Robins. I think that, as I indicated, we certainly must proceed with the installation of continuous casting. I think that is very important. There is some work going on in thin slab casting which would be casting a slab about 1½ inch or 1 inch thick, which would eliminate part of the downstream processing but not all of the hot-rolling process. That work is going on, as Dr. Cantor mentioned, with DOE sponsorship through United States Steel and Bethlehem, and also there was an announcement recently that Nucor Steel will be installing a trial plant for that kind of casting.

Mr. Packard. Are any of our foreign competitors using those processes now?

Mr. Robins. That process is not in commercial use anywhere in the world at this point in time, but there are several foreign companies that are also involved in developing the thin-slab-casting process. There is also a lot of work going on around the world in the thin-strip-casting process. Many companies in the United

States have already done a lot of research on that. National Steel, LTV Steel, and others.

The approach contemplated by the Keyworth initiative, however, is totally different than anything that is going on or has gone on in the way of research in the past, because of the fact that it intends to use an electromagnetic field to control the shape, which means that nothing will touch the liquid steel while it is solidifying. So the defects that would normally end up in the process on the surface because of contact with a mold or a moving belt or whatever other system other people have tried up to now should not be present. And that should yield, among other things, a significantly higher quality of steel.

Mr. PACKARD. The proposal calls for the industry to contribute in-kind, manpower and other in-kind processes. Will there be a time during the process where, particularly in the latter stages when they get to the development phase that you have referred to, the research and the design and ultimately the development phase, in the latter stages of that process will, or do you see the industry getting deeper involved with actual contribution of some of the capital required to carry it on in the development process?

Mr. ROBINS. I think that would be a very desirable way to have the project carried out to completion. Certainly as the new technology that is developed approaches larger and larger trials and closer and closer to commercialization, it should be expected that the industry would take a larger part of the funding for that. The extent to which we will be able to do that as the time comes depends on a lot of other factors. And it may well be that that support maybe would be done in somewhat the same way as the project that we alluded to that United States Steel and Bethlehem have running with DOE; where a substantial part of the upfront money is being put forth by DOE but there is a substantial payback provision in the event that the technology proves to be commercial. But I would like to say that it is certainly our intent to begin to assume more and more of the responsibility as the technology reaches commercialization.

Mr. PACKARD. The Science Committee has expressed concern in its report accompanying the fiscal year 1986 DOE authorization bill regarding the role which the universities will play in the steel initiative. What specific steps are you taking to ensure real and meaningful and significant university involvement in the initiative?

Mr. ROBINS. First of all, I should point out that there has been substantial university involvement up to this point, that several university professors and scientists have been involved in the development of the program. And, second, the program is organized with an overall steering committee to set broad policy and the administration of it, and two program advisory committees, one for each task, which will oversee the technical content of the two tasks, the direct steelmaking and the electromagnetic castings and those advisory committees have representation from the industry, from the labs and from the universities.

Third, it is part of the work plan of the national labs in carrying out the program that a substantial part of the effort will be done by subcontract from the national labs to various universities, depending on the specific nature of the actual research projects being done. And that will be overseen by these program advisory committees which have the university representation, so I am sure that that will be a good mechanism for ensuring that there is a reasonable amount.

What we really want to do is make sure that the work is done in the best place for it to be done. We do not have any preconceived ideas as to how much work should be in the universities or how much work should be in the national laboratories. But it is up to the project leaders and the program advisory committee to determine on a case-by-case, project-by-project basis, where the best place to do it is.

Mr. PACKARD. According to the National Research Council [NRC] report on the competitive status of the U.S. steel industry, the major problem in the integrated mills in the United States is not the lack of technology; they have had that of course. But primarily the inability to generate capital to implement the technology. Do you agree that that is one of the major problems?

Mr. ROBINS. Yes, I do.

Mr. PACKARD. What do you think the companies ought to do and how will they be able to address the major problem then, not necessarily the lack of technology, but the lack of capital or the ability to marshal capital forces to do what needs to be done?

Mr. ROBINS. Well, it is going a little bit beyond my area of expertise to be able to respond too intelligently, but I would, by way of answering, just refer to some of the remarks Dr. Cantor made with regard to financing methods; and also, at the hearing on the 17th, my chairman Mr. Luerssen also pointed out some novel financing techniques that are being developed to try to provide the capital to continue to modernize. As he described it at that hearing, Inland Steel at least has made use of a great variety of different kinds of financing techniques to be able to proceed with the continuous casting and electrogalvanizing and so on. Hopefully we will be able to continue doing that. But not unless, certainly, the outlook is one that indicates that the industry is eventually going to return to profitability on a permanent basis.

Mr. PACKARD. Why do you think that if the technology has been available, why has the industry been slow to move into the newer technological advances that would perhaps have allowed them to be more competitive?

Mr. ROBINS. I cannot really give you a definitive answer on that question. I think there are a variety of reasons. There is, of course, as you mention, the availability of capital. There is certainly the existing prior equipment and facilities which, as we have heard many times over, is very expensive to shut down in terms of its effect, not only in terms of capital but in terms of people and so on. I think that another part of it has to do with the market outlook and the uncertainty about the situation with imports and whether that would have an effect on the long-term viability of the industry, which certainly has an effect on the willingness of people to invest in it.

I emphasize these are guesses or assumptions on my part. I am not an expert in this area.

Mr. **Packard**. In your written testimony, Mr. Robins, you indicated or spoke toward task A and task B as a short-term mechanism. And then you conclude by saying,

> While the Keyworth Initiative is a substantial undertaking with potential revolutionary impact on steelmaking, it is quite limited in scope relative to the overall research needs of the steel industry.

Can you think of other things beyond those tasks that ought to be done or could be explored either in the research area or in other existing technology that is not encompassed within these two tasks?

Mr. **Robins**. I think that there are a number of things that could be accomplished in the shorter term, since we have mentioned the Keyworth initiative is looking at a minimum of 10 years before the first significant commercial process developments might come to fruition on the direct steelmaking.

Certainly the work that is going on in thin slab casting, I think, is indicative of the kind of work that should go on in the meantime. There should be more work in the rolling processes. Even though in the long term the direct strip casting might eliminate the hot rolling step. That again is a long time down the road and there is much improvement that could be made in hot rolling and direct charging and direct connecting and continuous casting for hot rolling for energy's sake. And there is considerable research that could go on in the development of new coatings for steel and development of new kinds of steel products that could enhance steel's ability to compete in the marketplace against other materials. And I should point out that this is really the area where probably the majority of industry funding is going at the moment is in the product research side, which makes it that much more important to try to get some help to see that there is enough process research carried out.

And there is still much that can be done on the primary side. Other techniques for eliminating coke from the blast furnace or eliminating pellets from the blast furnace, such as the KR process which has received some support from DOE and AISI in tests in Europe. It is a promising possibility for an interim step before the direct steelmaking step. So I think you could come up with, and people have come up with, a fairly substantial agenda of other kinds of research that should be going on now for implementation in say the 3- to 5-year period as opposed to the 10-year period.

Mr. **Packard**. Mr. Chairman, let me ask one more short question before I yield back. Is the objective as you see it now for the steel industry of this country to capture more and more of our own domestic steel needs; or do you see the possibility of eventually capturing some of the world market?

Mr. **Robins**. I think that at the moment we probably would be very well satisfied if we could capture a substantial part of the domestic need. But I really believe we should set our sights broader than that. And through some of the kinds of technology Keyworth envisions, the leapfrog technology, I would say that is a possibility. I would like to think it is a possibility. That we could become, again, competitive on the world market. Certainly if exchange rates change, things like that to more reasonable levels; and through the technology, if it takes particular advantage of our local strength—coal—so that we can do things at low cost on a world basis, I think that possibility might exist in the long run.

Mr. **Packard**. Thank you, Mr. Chairman. Thank you, Mr. Robins.

Mr. **Volkmer**. Thank you, Mr. Robins. Mr. Traficant?

Mr. **Traficant**. Thank you, Mr. Chairman. I really appreciate your testimony, Mr. Robins, and I have a couple questions perhaps in a different vein and more or less for your assessment and not so much maybe your knowledge of technical matters. But we have sort of developed an initiative to create a marriage in partnership, if you will, of the Federal Government, private industry, that would go forward and hopefully help us to compete with new technologies as far as the initiative is concerned.

You touched upon one point that hits my attention. You said the Department of Energy's concern is, in fact, energy; perhaps maybe there's not a concentrated effort being made in steel, as the steel initiative certainly should be made.

My question, to start it off, is, specifically, what are the lines of communications as you see them and you perceive them from your position in the private sector, in the research and development marriage between the Department of Energy and those Federal agencies such as Argonne, for example, that is to do some of this research and development? Is it all a pyramid-type structure with Department of Energy calling all the shots? Is there relevant communication and is there a good interchange, an interface, between those processes; and what is your outlook on the success of this type of Government process?

Mr. **Robins**. I think up to this point in general there has been pretty good communication between the industry and the Department of Energy, on those projects where it is clearly possible to ascertain a significant potential energy savings. I think that as projects have been suggested by the industry or by the Department of Energy, which has, in many respects, been very forceful in developing projects, that line of communication is very well open between the people in the Office of Industrial Programs, the people on the staff of the AISI and the individual company with certain people.

The communication is open but the dialog becomes a little more difficult in those kinds of projects where the benefits may be significant in other areas than in energy—although virtually anything you do in the steel industry has an energy impact because of the massive amount of energy that steel uses.

In those cases it has been, I would say, a little more difficult to reconcile the mission of DOE, as some of the people see it in terms of focus on energy efficiency, with some of the broader needs of steel industry research—even though, as I said, there's always an energy implication.

One simple example: We've had projects for which the major objective has been to increase the yield, the amount of final finished prime product that you will get out of a ton of liquid steel. And although you can very readily rationalize the fact that if you increase the yield and therefore do not have to remake that ton, you are obviously going to save a lot of energy; nevertheless, because it is described in terms of yield instead of in terms of how many millions of BTU's you are going to save. It makes it more difficult to communicate. I guess I would say that.

So certainly the focus is on energy and not on industrial competitiveness or the well-being of any particular industry or anything like that as far as DOE is concerned.

Mr. TRAFICANT. Well, certainly if we're going to have any success, those are the factors that have to become paramount in that partnership as well.

Mr. ROBINS. Yes. I certainly agree.

Mr. TRAFICANT. We talked about Government and we talked about the industry itself and their representatives. What role is labor playing insofar as the ramifications for labor down the line with expanded and newer technology, what role does labor have in this initiative and do they, in fact, have a representative to the steering committee or are they a part of the process which ultimately will change the focus of the steel industry?

Mr. ROBINS. Up to this point in time there really has not been any labor representation on the steering committee. The steering committee has been made up primarily of representatives from the national labs, from the Office of Science and Technology Policy and from the research side of the steel industry. Virtually all of the industry members on the steering committee are research vice presidents, that level of people. There has been very little input at this stage from the manufacturing side, from the labor side or elsewhere. Since it is at this point primarily a research initiative.

I would think that the—I certainly agree that there would be a time when that input from other parts of the steel picture besides research is going to be very important. But until we begin to see some real development or promise coming out of the national laboratories, I think that it would be hard to say what role other people besides the research community would be interested in playing at that point.

Mr. TRAFICANT. But you do see down the line the time when that infusion of the labor groups would become a part of the process?

Mr. ROBINS. I think that would be—there would be an appropriate point in time when that would be desirable, yes.

Mr. TRAFICANT. Let me ask you this. What role does your labor force play in Inland's development/implementation of new technologies as you practically start to convert them into your own business pursuits?

Mr. ROBINS. I think the labor role is critical in the implementation stage. I think that labor and management need to work very closely together to provide the training, the understanding of new technology as it is ready to be implemented and to develop operating practices, operating procedures. This requires a real partnership between labor and management and other parts of the community, the technical people of course, in order to be able to impart that knowledge. It is critical though.

Mr. TRAFICANT. Yes. I think perhaps maybe not necessarily a question for you or to make you the guy on the spot, but I wonder why labor does not become involved a little earlier in the process, in most of these matters, and as a result we seem to have an effect where there is not everybody mutually and very happy moving toward the same goals. And there seems to be a dichotomy sometimes in pursuits of interest. Do you have any response to that?

Mr. ROBINS. I think that perhaps the way to handle that—I think it is desirable for everybody who at any stage is going to require some involvement, to at least be knowledgeable of what is going on at every stage. And I think therefore that it would certainly be very desirable to ensure that there are some lines of communication with the labor community as well as the other communities in terms of providing the knowledge of what is going on at this stage, so that in the event at least that they would see some logical reason or opportunity to have some greater problem with that, they would be in a position to know that that is the case and to say so.

Mr. TRAFICANT. In regards to research and development efforts not just throughout the industry, but perhaps on behalf of Inland, how much of your budgeted dollar applications are made toward research and development, on what percentage basis?

Mr. ROBINS. Well, a lot lower than we would like.

Mr. TRAFICANT. What are they?

Mr. ROBINS. Generally in the neighborhood of about a half a percent of sales. That is probably generally pretty indicative of most of the integrated steel industry. Some of the specialty steel companies, because of the nature of their business, would put somewhat more than that into research. But in our case that is about what it is.

Mr. TRAFICANT. But is it a reflection on behalf of industry that they feel, well, times are rough, maybe the Federal Government will come in and provide all the research and development money—which certainly would not be the intention of the Government. Hopefully it is to spur industry participation in that process. And industry's participation is best evidenced by their commitment financially.

Mr. ROBINS. Yes. And I assure you that that is not the driving force behind that level of input. That unfortunately has been the level of input for some significant period of time and it is primarily a result, certainly, of the profitability situation within the industry.

Mr. TRAFICANT. I have a couple of other quick questions, Mr. Chairman. I don't want to belabor the committee here, being a new member of it.

Mr. VOLKMER. You have 2 minutes left.

Mr. TRAFICANT. I do have 2? Well, thank you, Chairman.

This new near-net-shape casting process, how long do you see or foresee that down the line as becoming an integral part of the American steelmaking capabilities as practically provided by industry?

Mr. ROBINS. I would say it is on the order of at least the 10-year magnitude before you would see a significant number of commercial installations. You may see the first commercial installation somewhat sooner than that. But on the schedule that the laboratories are on now, we would not be seeing a larger scale pilot type trial for at least~~—maybe~~ 3 or 4 years. They are now designing a bench scale unit. They will have to build that as soon as the funds become available in October and operate that over a significant period of time. But we are really talking substantially down the road before——

Mr. **Traficant**. Well, was that technology concept conceived here in the States or is that now a process of another Government or another country's industry source?

Mr. **Robins**. It is a combination actually. There is somewhat similar technology utilized in the aluminum industry. And that was developed in Russia. And some of our aluminum companies have licensed that from the Russians, have applied it in the United States.

Actually, normal continuous casting started that way also. The problems of extending aluminum technology to steel technology are monumental, which is one of the reasons why regular current continuous casting lagged behind its advent in the aluminum industry. The temperatures are so much different. You are talking maybe 1,300 or 1,400 °F as compared to 2,900 °F.

But the knowledge that Argonne brings to it in terms of the work that they have done in trying to develop electromagnetic field containment for nuclear processes, we hope, is an order of magnitude improvement of the technology and will make a significant difference in the application of this technology to steel.

Mr. **Traficant**. And in followup to that, will there be significant difficulties using magnets to contain liquid steel during the casting process?

Mr. **Robins**. All I can say is that Argonne thinks they can do it. And that they have gone through some initial calculations and indicate that they still indicate that it is a feasible thing to try to do.

It is possible, we know that it is possible, to move and to shape liquids with electromagnetic fields. And whether we can do it at those temperatures and without over-oxidizing the steel or having an adequate amount of protective covering or whatever, there are a lot of those kinds of problems to resolve.

The concept of shaping liquids with electromagnetic fields, that is a proven concept. That gives us hope.

Mr. **Traficant**. Thank you, Mr. Chairman, I yield back.

Mr. **Volkmer**. Thank you. I have a few questions, Mr. Robins. One is that basically the Office of Management and Budget, when the Keyworth initiative came over from OSTP, put a thumbs-down on it. Generally the philosophy that there had pervaded in that office that applied research, as such, should be done by business, industry, commerce, whoever is involved and who is going to directly benefit from it.

In the event that we did not have Federal involvement, would the steel industry be able to do the Keyworth initiative, these two leapfrog concepts?

Mr. **Robins**. I doubt it. Certainly not on the time scale and the time basis that is contemplated in the initiative. Perhaps in bits and pieces over a very long period of time. But the way this is set up, very unlikely.

Mr. **Volkmer**. All right. That is the conclusion that the Congress came to and that is why we were continuing to try to get the money in there.

Mr. **Robins**. Right.

Mr. Volkmer. I just wanted to verify that. The second thing is, as I understand, not all steel companies are involved in putting money into the Keyworth initiative, is that correct?

Mr. Robins. The initiative is really organized through the American Iron & Steel Institute at the moment. And that involves, I guess, about 50 steel companies. And so those companies are participating in the funding for it.

At the moment, companies that are not members of AISI are not participating.

Mr. Volkmer. That's correct. Now, my question, though becomes: let us assume that everything comes out positive and that 6 or 7 years from now it can be applied commercially and you can use it. Will only those who belong to the Keyworth initiative be able to obtain the data in order to implement it in their steel plants or will anyone be able to do that?

Mr. Robins. I would suspect that, typical of these kind of developments, that there are always some kind of arrangements for anybody who did not develop the technology. And, in fact, it is very difficult in the steel industry to keep technology secret for any significant period of time. Technology travels not only around the country but around the world in steel very quickly.

Perhaps anticipating another question, one of the things that will keep us competitive, even though the technology may move around the world with this, is the fact that we intend to direct it toward utilizing the kinds of resources that are unique to the United States. For example, as I mentioned, making it coal based. The fact that it is coal based means that even if we develop a direct steelmaking process, for example, Saudi Arabia is not going to be interested in it, because they would want a process based on oil, not one based on coal.

The same thing is true in the casting area by directing the product development in the nature of the work. But typical of these kind of arrangements is some kind of licensing or some kind of provision by which technology would eventually be made available to others, perhaps with some time delay. Which is some incentive for some people participating in it directly.

Mr. Volkmer. But, of course, there would be nothing to stop someone from utilizing that technology in their own steel plants, is that correct?

Mr. Robins. We would probably look for possible ways of delaying that as long as possible. But in the long run, the best way to do it is, as I said earlier, to develop technology that takes advantage of whatever unique attributes we have in this country. So that even if they did pick it up and use it, it would not be as beneficial to them as it is to us using it in our country.

Mr. Volkmer. OK. In your testimony regarding the interim technologies which we need to develop in the steel industry, you mentioned increased need for computerization. And where in the production process would this automation usually be utilized?

Mr. Robins. It would really be from beginning to end. In coke making, iron making, through the rolling steps and the scheduling and the coordinating of steel movements throughout the plant. There really is a very large field, a very large need, for massive manufacturing automation, scheduling, a computerization type of effort.

Mr. VOLKMER. What headway are we making on—you mentioned that you were doing research into the use of the sensors, what does that outlook look like?

Mr. ROBINS. Those projects that we have been sponsoring collaboratively between AISI and in some cases NBS and some cases national labs—one was with Los Alamos, for example—they have been moving along generally very well. There are four in progress now: One on temperature measurement throughout a slab, which is required for a good hot rolling; one on porosity, internal defects in slabs; one on sampling of molten metal analysis on a steelmaking furnace so that we can get instant analysis. They have all been working very well. And although we have no commercial developments yet, they are generally about 1 year or 1½ years down the road. They have been making substantial progress. And most of all, I think they have demonstrated that this kind of approach works, this collaborative effort between industry and other entities, whether it is governmental or not.

Mr. VOLKMER. Just out of curiosity, in the proposed direct, what I call direct reduction of the iron ore, is it still estimated that you would need refractory?

Mr. ROBINS. Our thought is that probably the midterm program, the one that is based on coal, may well need refractory. And therefore, against that likely possibility, we think it is important to carry on some of the work in refractory right from the beginning. In the long run, especially with some of the more innovative technologies, there may not be any refractory involved because there may not be high temperature processes. And there also may be high temperature processes but utilizing other methods of containment, like electromagnetic, for example. But a process utilizing refractory is certainly one of the more probable outcomes at this stage and so it is important to continue the refractory.

Mr. VOLKMER. The reason I mentioned that, I don't know if you know where my district is, and I doubt very many people in this room realize that my district relies a great deal on the steel industry. I have seven refractories in my district that are steel and aluminum. And they are all pretty well down right now, too.

Mr. ROBINS. Yes.

Mr. VOLKMER. So it is just not the steel industry. So that is why I asked that question.

Anyone else have any additional questions?

[No response from Mr. Packard or Mr. Traficant.]

Mr. VOLKMER. OK, thank you very much, Mr. Robins. I appreciate your being here today and you can be excused. And we will continue the questioning now with Dr. Cantor.

OK, the gentleman from California.

Mr. PACKARD. Thank you, Mr. Chairman. You spoke, Dr. Cantor, to the joint venturing that is now beginning to take place as a means to try to develop financing programs. What do you think that will do to our U.S. steel industry as we get an infusion of foreign companies into our companies? What are the down sides that you see?

Dr. CANTOR. I'm not sure what you mean by the down sides.

Mr. PACKARD. Well, are there some potential problems out there with the joint venturing to our national security, to the country itself, to the industry itself? Obviously it is a means to get financing, badly needed financing. But are there some residual problems that we have not addressed?

Dr. CANTOR. Let me first add another advantage, perhaps. One that Mr. Robins referred to in his discussion. This may be a way also to achieve technology transfer from other countries to our country. With respect to the national security issue, I see the investment in the domestic steel industry by anyone as keeping plants open and more modern and thus able to produce the steel that we may need for national security.

I do not doubt that there are some down sides. But in the near term, at least, the question is how is the industry going to survive at—how is it going to survive, how is it going to compete for market share without investment in new processes, new ways of producing steel?

Mr. PACKARD. So you see that the pluses certainly outweigh the potential down sides in terms of allowing the industry to move forward?

Dr. CANTOR. Yes, sir.

Mr. PACKARD. In your testimony you spoke, and let me quote,

> To survive in this market, integrated steel companies must cut costs. They can do this by developing and installing new processes for making steel; they can do this by eliminating inefficient capacity, replacing it in whole or in part by modern furnaces and rolling mills; they can attempt to reduce labor costs and are likely to do so by negotiating work rule changes, lower hourly compensations or both.

Do you think that it is possible for these cost reducing mechanisms to be implemented?

Dr. CANTOR. On the collective bargaining side, that obviously is something that we will see in the next year when the companies and the union sit down and negotiate a new contract.

What cost reductions could do though, let's say cost reductions on the labor side, perhaps $5 an hour—and I realize there are a lot of people here that don't want to hear that—that could conceivably lower costs of production by $25 to $35 a ton, which could make quite a difference in the industry being able to capture some of the market back from other places which have been able to sell it for lower prices. Currently the industry is discounting significantly from list prices. Somebody in the industry recently told me "forget about looking at the list prices, you would be the only one doing so."

Now how to get that $35 a ton, whether it be through interest rates, whether it be through other cost reductions, whether it be through increased efficiency, increased yield, it could make a considerable difference as to the competitive stature of the industry.

Mr. PACKARD. The Congress and the President, the administration, were willing to restrict in the Steel Import Stabilization Act last year, they were willing to restrict the U.S. steel market for 5 years, with the caveat that the industry would be willing to put back their capital, back into the modernization process and trying to implement some of the restructuring. Do you think that the industry would be able to do that and has a commitment to do so?

Dr. CANTOR. Yes, I do. I stated so both in my prepared and in my oral testimony. They have been doing this and have been doing this over the years, investing more, making more in capital expenditures than they have generated in what up to now at least I have been able to identify as major components of cash flow. So they have been doing this. The question though, as I stated in my prepared testimony, is that enough? The industry says that the $2.4 billion number that I used is substantially below the amount they need. I might also add that that $2.4 billion expenditure, capital expenditure, was only for the period 1979 to 1983. I understand that the data for the industry as a whole, as compiled by the American Iron & Steel Institute for 1984, will show a substantial reduction for 1984, below $2 billion. That will still be greater than their cash flow from steel operations.

Mr. PACKARD. How important is the steel industry to the United States?

Dr. CANTOR. I'm pausing, Mr. Packard, Congressman, because I'm trying to do some mental calculations to give some indication of that. If we are talking about 100 million tons, we are talking 280,000 people working directly in the industry. We are talking about another third, perhaps a greater share or number of people in other industries that supply the industry, the iron ore industry, transportation industry and so on. We are talking about an expansive impact on the economy as a whole.

Mr. PACKARD. Do you believe that the 100 million tons is the level that you see the industry remaining for some time? Is that about the size of the industry here in this country?

Dr. CANTOR. The industry reports that it has about 135 million tons of capacity. The market for steel, the outlook projected by Data Resources Inc. for the next several years, is approximately 100 million tons. Therefore, allowing for some adjustment for loss of yield and so on, you are talking about an industry of 120 million tons, 125 million tons of capacity if it were running full out, to produce the 100 million tons.

But keep in mind that you are talking also about 20 million tons of steel being imported, at least under the present steel program. So that conceivably we may have even more capacity that we perhaps do not need in the short run. In the long run, I am sure the steel companies would love nothing better than to see the imports go away completely and to be able to compete with plastics and aluminum and go back to that 135 million tons.

Mr. PACKARD. To what extent do you think that the lack of technology or the contribution that technology has made to production and the problems that we have recognized now and have, has there been a lack of technology that has contributed to the industry's sad condition?

Dr. CANTOR. Clearly other countries have implemented technological change more rapidly than we have. There is no question about that. We have had continuous casters in the United States since the mid 1960's—United States Steel at its Gary works, I believe, in 1967. We have been working on new technology, some of them incremental, all the way through the past 10 or 15 years when the emergence of the competitive market place that I tried to describe became apparent. Even during the recent recession, the

1982 recession, the U.S. steel companies installed or commissioned 16 continuous casters. This is when the steel demand was falling and the steel output was falling and profitability was a word that could be written out only in red ink.

But other countries have installed continuous casters more vigorously, more aggressively than we have in the past, as they built new industries.

The Taiwanese, for example, essentially emerged as a major Asian producer only in the late 1970's, in 1979, when they decided to go into the export market.

I think there are many other countries, industries in many other countries. And when you are starting from ground zero, when you are starting with a brand new plant it is much more cost effective to install state of the art technology, the current state of the art technology, than to patch it into other facilities.

I think it is unlikely, for example, that we will find one of the major steel companies which has open hearth facilities in eastern Pennsylvania and in the State of Utah, I think it is unlikely that we will find them installing a continuous caster in those plants—not to go along with what has become an obsolete and certainly very inefficient open hearth furnace process.

Mr. PACKARD. So essentially you see us replacing more than modernizing?

Dr. CANTOR. The replacing has been a major part of the modernization process in my opinion. Getting rid of the old obsolete capacity has been a major part of that. A few years ago when people asked me about declining steel industry, the declining capacity, I took a look at the data and the fact is that the decline was due to the elimination of obsolete capacity and not due to the nonconstruction, if you will, of more modern facilities.

Mr. PACKARD. Environmental constraints: to what extent is that going to play a role in the use of coal as is involved in the proposals, and other processes that are involved in the steelmaking; to what extent will that be a problem for the industry?

Dr. CANTOR. I am not able to answer that question. Some of my colleagues in another division of the Congressional Research Service have been working on this. With your permission I will submit to the record copies of their analyses of the impact of environmental concerns, particularly the acid rain question.

[The material referred to follows:]

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

THE STEEL INDUSTRY COMPLIANCE EXTENSION ACT BROUGHT ABOUT SOME MODERNIZATION AND UNEXPECTED BENEFITS

DIGEST

In 1979, a presidential committee studying ways to revitalize the ailing U.S. steel industry reported that the steel industry, more than any other, needed capital to modernize and control pollution. Specifically, the committee estimated that the industry's capital shortfall for the 1980-84 period would be $1.7 to $2.0 billion annually. As a result of the committee's findings and recommendations, the Congress passed the Steel Industry Compliance Extension Act of 1981 (known as Stretchout) on July 17, 1981.

Stretchout allowed the Environmental Protection Agency (EPA) to defer, for approved steel companies, the date for meeting Clean Air Act requirements from December 31, 1982, to December 31, 1985. For a company to qualify for Stretchout, EPA had to (1) determine that the deferral of air pollution control spending was necessary to improve the efficiency and productivity of steel company facilities, (2) find that the company will spend on modernization, by July 1983, an amount equal to the planned capital expenditures being deferred from air pollution control, (3) reach agreement with the company for a federal judicial decree to comply with emission limitations at all its facilities by December 31, 1985,[1] (4) find that the company had sufficient funds to comply with (3) above, (5) find that the company is in compliance with existing federal judicial decrees, and (6) determine that Stretchout would not degrade air quality during the extension.

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[1] Judicial decrees (consent decrees) under this legislation are legally binding agreements between the federal government and a steel company and are approved by a federal district court. They specify air pollution control goals, deadlines, and penalties associated with each of the steel company's facilities.

Overall, the program had only limited success in achieving its objective--assisting the steel industry to modernize its facilities. However, some unexpected cost reduction benefits did occur to the industry from sharing pollution technology. In the final analysis, steel companies committed only $49 million on modernization as a result of Stretchout--compared to $500 to $700 million the steel industry had estimated would be spent if the act were passed. GAO reviewed Stretchout to determine what the program accomplished and what could be learned that would be useful in designing future programs.

STRETCHOUT PRODUCED RESULTS DIFFERENT THAN EXPECTED

Stretchout was expected to appeal to many firms in the steel industry and result in large modernization expenditures which would help revitalize the industry. Ten companies representing about 50 percent of U.S. steel production in 1982 applied to EPA for Stretchout benefits. Although these 10 companies proposed modernization spending of about $828 million, EPA determined that only 6 were eligible. Of these, five companies--representing about 23 percent of U.S. steel production--participated and their actual spending totaled $49 million. (See pp. 7 and 8.)

While spending on modernization was not as high as anticipated, other unexpected benefits did result. For example, Stretchout required that each applicant and EPA agree to a federal judicial decree covering all of the applicant's facilities. According to EPA attorneys who negotiated these decrees with the steel companies, some applicants, wanting to hasten the process and take full advantage of Stretchout, agreed to terms that they may not have agreed to under other circumstances, e.g., consenting to air pollution controls on facilities not previously covered. Additionally, EPA considers these decrees easier to enforce than the more complex enforcement provisions of the Clean Air Act. (See pp. 8 and 9.)

Another benefit of the program was that the United States Steel Corporation--prior to being approved for Stretchout--agreed to share a highly cost-effective proprietary emission control process with all other companies free of charge. Two companies plan to adopt this new technology at a combined estimated savings to them of $9.8 million. (See p. 9.)

STRICT DE MINIMIS INTERPRETATION FURTHER RESTRICTED PROGRAM ELIGIBILITY

The legislation required that firms applying for Stretchout had to comply with existing federal judicial decrees on air pollution control but could be excused if their violations at the time of the application were de minimis (negligible, insubstantial, or inconsequential). However, the legislation did not provide criteria for determining whether violations were de minimis.

With passage of the legislation, EPA was prepared to grant Stretchout to as many companies as possible because it believed that strict interpretation of the de minimis requirement would preclude virtually all steel companies from qualifying for Stretchout. Subsequently, the Department of Justice, which had to approve the Stretchout agreements, issued an opinion giving de minimis a strict interpretation. (See pp. 11 and 12.)

Using the stricter interpretation, EPA found 4 of the 10 applicants ineligible for Stretchout. EPA believes, however, that three of the four applicants would have been ineligible even if its more liberal view of the de minimis standard had been applied. These three companies had violations which were clearly not de minimis. However, EPA believes that the other company--Inland Steel Company--and its $167 million in proposed modernization might have been included in Stretchout. In total, these four applicants accounted for about $587 million of the $828 million of the proposed modernization spending. (See pp. 13 and 14.)

OTHER FACTORS CONTRIBUTED TO REDUCED MODERNIZATION SPENDING COMMITMENT

Of the six remaining applicants, one withdrew because of poor economic conditions and five were eventually approved for Stretchout. These five applicants initially proposed to spend $235 million on various modernization projects but actually committed only $49 million. Most of this reduction was due to reduced spending by the United States Steel Corporation. In general, less money was spent because EPA or the companies determined that less pollution control funds were eligible to be diverted for modernization projects. In some cases, the companies overestimated the cost of pollution control projects that would be deferred, or completed the projects before Stretchout began. In other cases, EPA determined that the proposed pollution control projects were either not eligible for the Stretchout program or were not necessary to meet air pollution control requirements. Likewise, an industry representative told GAO that many companies did not apply for Stretchout because they could not afford to use diverted pollution control funds for modernization purposes. (See p. 14.)

RECOMMENDATION TO THE CONGRESS

The Congress has recently considered proposed legislation which, similar to Stetchout, would have extended compliance deadlines under the Clean Water Act as well as deadlines for industries other than steel under the Clean Air Act. In addition, a bill was introduced in the Senate that would provide a mechanism for making necessary adjustments to regulatory programs, including extending regulatory compliance deadlines.

If in the future the Congress considers legislation to extend pollution control or other regulatory compliance deadlines, GAO recommends that the Congress specifically define the criteria that EPA or other agencies should use to determine program eligibility. This would be particularly desirable when de minimis requirements are being considered as a criterion for program participation. (See p. 21.)

AGENCY COMMENTS

Both EPA and Justice commented on a draft of this report. EPA generally agreed with GAO's conclusions and recommendations and commended GAO for the clear, accurate reporting of this complicated program. Justice agreed with the recommendation to the Congress and stated that, if crucial terms such as de minimis were clearly defined in any similar legislation, much confusion and delay could be avoided. Justice noted, however, that obtaining clearer definitions may be difficult, but said that resolving these issues in Congress is far preferable to leaving them to the enforcement or judicial process for resolution.

Other comments by EPA and Justice helped clarify some of the issues discussed in the report. Justice said that the report assumes that the steel industry would have been expected to spend $500 to $700 million on modernization if Stretchout was implemented. Justice stated that these estimates were unrealistic and are not a fair measure by which to judge the success of the act. GAO does not use these estimates to judge the success of the act but to reflect initial judgments in the steel industry as to what could be expected from Stretchout. In addition, the 10 companies which applied for Stretchout proposed over $828 million in modernization, considerably more than even the initial estimates.

Justice said that there was reason to believe that more than $49 million was spent on steel industry modernization projects; therefore, it asked that GAO poll all applicant steel companies to determine how many modernization projects were constructed in addition to projects constructed under Stretchout, and at what cost. The objective of GAO's review was limited to determining the amount of funds committed to modernization specifically under the Stretchout legislation. However, during the review, GAO did request the information suggested by Justice from three companies. They declined to provide the information because divulging the projects and their respective costs could affect their market competitiveness. (See pp. 10 and 21.)

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PICKING UP THE TAB: THE COST OF ACID RAIN LEGISLATION IN INDIANA

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PICKING UP THE TAB: THE COST OF ACID RAIN LEGISLATION IN INDIANA

EXECUTIVE SUMMARY

Concerned about the potential impact of proposed acid rain legislation on their State, the Indiana Congressional Delegation requested the CRS to assess the effect of various sulfur dioxide (SO2) reduction strategies on Indiana. This report analyzes two SO2 reduction scenarios based on the leading legislative proposals in the House and Senate: H.R. 3400 and S. 768. H.R. 3400 proposes a 48-State program to reduce SO2 by 10-million tons and NOx by 4 million tons over the next decade. A key aspect of the bill is a proposed 1-mill per kilowatt-hour fee on non-nuclear electricity generation within the contiguous 48 States to partially fund the capital cost of control equipment. S. 768 proposes a 31 eastern State acid deposition impact area and requires by 1994 a 10 million ton reduction in annual SO2 emissions from actual 1980 emissions. In addition, with minor exceptions, any increases in SO2 emissions from existing or new major stationary sources occuring between 1980 and 1994 must be offset. Assuming future growth, this "cap" on SO2 emissions increases the size of the required reductions under S. 768 as compared to H.R. 3400.

Assessing the impacts of proposed acid rain control costs on Indiana electricity consumers is difficult. Assuming current conditions and technologies, the present costs of controlling sulfur dioxide (SO2) emissions can be estimated, but it is almost impossible to predict the size and relative significance of those costs in the context of the future when they would be borne. In this analysis, we have identified five major uncertainties regarding the absolute and relative costs of SO2 control costs compared with other potential future costs facing Indiana utilities and industry. First, there is general uncertainty regarding the regarding the direction of basic parameters which make projecting baselines such as electricity cost in the absence of acid rain legislation problematic. The volatility of the last 15 years of energy demand and prices; of inflation, especially in the construction industry; and of basic economic parameters such as interest rates illustrate the difficulty involved. Numerous crystal balls have been shattered because of these fluctuations. It is by no means obvious that projecting electricity costs for the next 15 years will be any more successful. Indeed, in preparing this study, CRS asked Indiana utilities to estimate future electricity rates; not one would venture to do so.

A second major problem is comparing the relative magnitudes of some specific economic burdens that may affect both individual utilities and consumers. In some cases, these burdens could overshadow acid rain costs. For example, Public Service of Indiana's cancellation of the Marble Hill nuclear facility will probably cost PSI and/or its consumers more than the capital costs of acid rain controls would. It also puts a financial burden on the utility and/or its consumers that make it difficult to accept additional costs. Similarly, such major Indiana industries as steel-making and auto manufacturing are undergoing substantial economic, technological, and managerial changes; how significantly increased electricity prices due to acid rain controls might affect those changes seems beyond prediction.

Thus, a third major difficulty arises from the diversity of industries within the State, their dependence on electricity and their future economic health. Residential demand involves a relatively homogenous market in comparison with industrial demand, which involves widely disparate segments in in terms of usage, significance of electricity costs to the value added to products, and current and future economic health aside from electricity prices. Also, some industries in Indiana are also significant SO2 emitters, and therefore, could be required to reduce. This makes general statements about industrial impact from SO2 reductions difficult to make.

A fourth difficulty regards the specific alternative control technologies which may be available in the 1990s to reduce SO2 emissions. Reflecting currently available technology, this analysis relies on scrubbers or fuel-switching to achieve the mandated reductions. However, technologies will be available in a few years which can significantly reduce SO2 and/or NOx emissions without significantly reducing the efficiency of a plant or creating dislocations in the coal market. These technologies range from incremental combustion modifications for reducing NOx emissions to advanced combustion designs for efficient and clean burning of high-sulfur coal. These technologies could significantly reduce the total cost of SO2 reductions and their impact on Indiana. 1/

Finally, there are numerous possible allocation strategies Indiana could use in meeting any SO2 reduction requirement. This analysis is based on one possible allocation strategy: percentage reduction of emissions. This allocation would result in some very acute situations for some of the affected utilities. However, the analysis indicates that, at least for the H.R. 3400 scenario, flexibility would exist for the State to reallocate the reductions somewhat to achieve the emissions reductions possibly more cost-effective than the allocation system used here. The allocation formula used in this analysis may have resulted in reductions exceeding the potential H.R. 3400

1/ Parker, Larry., and Robert E. Trumbule. Mitigating Acid Rain with Technology: Avoiding the Scrubbing-Switching Dilemma. Prepared for the House Committee on Science and Technology, June 1983. committee print.

reduction requirement by as much as 6 percent. The margin of error for S. 768 could be similar, but is impossible to determine as future emissions cannot be predicted with any certainty.

Because of these uncertainties, we urge readers to focus on the trends in the analysis and the various themes that can be derived from the analysis, and consider the cost figures as illustrative rather than absolute. A more thorough knowledge of these themes may assist Indiana in developing less disruptive alternatives and modifications to current proposals and more cost-effective implementation plans if such a bill were passed. Some of those themes which have particular significance to Indiana are discussed below.

1. The high initial reduction requirement contained in H.R. 3400 and S.768 represents a mixed blessing to Indiana. For H.R. 3400, the reduction requirement combined with the 90 percent capital subsidy assumed in the analysis effectively discourages much of the fuel switching which might occur under a "freedom of choice" scenario. For S. 768, the even higher initial reduction requirement with the proposed SO2 emissions cap also discourages some fuel-switching (i.e., converting a facility from burning high-sulfur coal to a lower-sulfur coal), as the reductions required are sometimes beyond the reach of fuel-switching alone. Under the scenarios used in this analysis, the gross coal industry jobs displaced by H.R. 3400 for the six utilities are probably about one-fourth (650 jobs) those projected under an 8-million ton, "freedom of choice" scenario. For S. 768, the gross coal industry jobs displaced are probably about the same as under an 8-million ton scenario (about 2300 jobs).

The counterpoint to this is the cost to utilities. The annualized costs of the scenarios analyzed in this report ranged from about $240 million a year under H.R. 3400 to about $550 million a year under S. 768 for the six utilities examined. These costs are generally higher than some econometric studies have predicted, but less than what the utilities have generally estimated. There are several reasons for this, including interpretations of the bills, assumed reduction strategies, and equipment costs. As noted in the opening paragraphs of this executive summary, there is sufficient uncertainty regarding future events to prevent anyone from producing the "right" numbers. However, it is important to note that if one attempts to lower the utility costs by assuming more potential for fuel-switching than used in this analysis, then one must also raise the job displacement in Indiana's coal industry resulting from the fuel-switching.

2. The proposed S. 768 emissions cap could prove very costly to Indiana. Projecting future SO2 emissions for any State is difficult. For example, many models are predicting a general decline in Indiana's SO2 emissions through the year 2000. If this were to happen, then an emissions cap would cost Indiana nothing. However, Indiana has several large coal-fired power plants scheduled to begin operations over the next ten years and few retirements scheduled. With several large nuclear plants cancelled over the last few years, it seems less likely that Indiana's emissions would decline rapidly by 1995.

Assuming Indiana utilities follow an emerging trend in the industry toward rehabilitation of older units and complete construction of scheduled units, the S. 768 emissions cap could present some difficulties to some State utilities. In particular, Hoosier Energy, Indiana and Michigan Electric

Company, Northern Indiana Public Service Company, and Southern Indiana Gas and Electric Company would have to operate some scrubbed facilities on compliance coal (scrub and switch) in order to meet the reduction requirement and the cap. Additional reduction required by the emissions cap is estimated to cost the six utilities examined at least $1 billion over the scenario without an emissions cap. Other alternatives are possible. Depending on electricity demand in the 1990s, these utilities may have excess capacity which they could mothball to bring their emissions down.

3. A 90 percent capital subsidy as envisioned in H.R. 3400 would save Indiana a considerable amount of money and rate shock. The cost-sharing approach in H.R. 3400 has two purposes: (1) lower the overall cost of reduction to the Midwestern States, and (2) lessen the price spike that results in the first years of operation from placing large capital investments into the ratebase. For most of the utilities examined in this report, the 90 percent capital subsidy is successful in reducing both the cost of compliance and the rate impact of placing that investment in the ratebase.

In terms of absolute costs, the analysis here indicates that the H.R.3400 type subsidy saves the six Indiana utilities examined about $2 billion in capital costs over the $6.6 billion in total costs incurred under the same program without the subsidy. Accounting for the 10 percent paid by the utilities and the 1-mill collected, this subsidy represents a 52 percent reduction in capital costs or a 33 percent reduction in total costs over the 20 years of the program. Without an H.R 3400 subsidy, the equivalent program would cost the six utilities about $470 million annually, compared with $240 million annually with the subsidy.

Besides lower overall costs, the impact of this cost is softened by the cost-sharing mechanism. Generally, when a capital-intensive project enters a utility's ratebase, the first-year cost is the most expensive. Subsequent annual costs decline as the facility depreciates. If a utility employs an accelerated tax depreciation schedule, this decline can be very significant in the first few years of the project.

For some of the utilities in this analysis, proposed SO2 reductions are assumed to result in a capital intensive program. Without cost-sharing under the S. 768 scenario, there are some potentially significant price spikes in the first few years of the program. This is particularly true for Public Service of Indiana, with average residential bills (750 kilowatt-hours consumption) rising about $13.00 a month, and Indianapolis Power and Light, with residential bills rising about $11.00 a month in the first year. Such increases would moderate significantly with time: the seventh-year costs would be about half these first-year costs.

In contrast, under H.R. 3400, we estimate that the first-year rate increases would be $4.90 and $2.80 a month respectively for the two utilities. Perhaps more importantly, by the seventh year (after the fee had run out), these costs would fall to their 20-year levelized costs of $3.10 and $1.60 respectively.

The cost-sharing formula does not benefit two utilities examined: Hoosier Energy and Southern Indiana Gas and Electric Company. For both utilities, a strong case can be made for using fuel-switching to achieve a significant portion of the reduction, even with the subsidy. Under the reduction strategies employed in this analysis, these two utilities would be net losers under such a cost-sharing arrangement, as fuel-switching is not subsidized under H.R. 3400.

4. Although mandating technology can preserve a market for high-sulfur midwestern coal, it does not guarantee that specific jobs or mines would be protected. As noted earlier, the technology subsidy is reasonably effective in preventing massive job displacement in the Indiana coal industry. However, given the uncertainty about future coal contracts and mine expansions, which mines or high-sulfur coal producing States would benefit from this protection is unclear.

5. As the users of over one-half the electricity sold to Indiana consumers, industry will inevitably bear a significant portion of the State's costs of meeting any acid rain program. The specific costs to particular industrial sectors are not predictable, for reasons that include uncertainties about the future of particular industries and firms, uncertainties about how reductions would be allocated among emitters, and uncertainties about how utilities would distribute acid rain control costs across their consumers.

For most industrial firms in the State, an assessment of impacts would require combining the estimates prepared in this analysis of costs by utility with firm-by-firm expectations concerning marginal energy costs 10 to 20 years in the future. While such specificity was not possible in this paper, indications of the dependence by industry type and by locale are contained in tables in the report showing electricity as a percentage of value added by Standard Industrial Category and in tables showing the distribution of industrial use of electricity by utility and by Standard Metropolitan Statistical Area.

6. With these uncertainties in mind, the industrial sector with the most potential to bear a large share of the cost burden is the heavily electricity-dependent primary metals industry, which is also the State's most important industry in terms of value shipped and of employment. There are two major components of Indiana's primary metals manufacturing: Alcoa's aluminum smelter at Warrick and the iron and steel industry located in the Gary-Hammond-East Chicago area. Each of these two components used about 16 percent of the electrical energy consumed by the industrial sector in 1980-2. However, the potential impacts of acid rain controls on these two industries may differ significantly.

Through a subsidiary, Alcoa can generate 80 percent or more of its own electricity needs; the effects of acid rain legislation on Alcoa Generating Corporation would depend on implementation questions that can scarcely be guessed at; it is not even certain that Alcoa would be subject to direct abatement requirements. Conversely, the steel companies purchase electricity (as well as gas) from Northern Indiana Public Service Company, which would be directly required to abate emissions under proposed legislation and which already has the highest electricity rates in the State. NIPSCO is heavily dependent on these industrial sales, and has been or presently is negotiating with its large customers over electricity and gas rates and supplies in an effort to protect its market.

7. In conclusion, while it is clear that specific provisions in proposed Federal SO2 reduction legislation are very important in influencing Indiana's reduction costs, the State of Indiana has some ability to control both total program costs and distribution of those costs among its various economic sectors. This report indicates that cost-sharing and

emission cap provisions in proposed legislation involves billions of dollars to the State and its economy. However, the analysis is based on numerous assumptions--many of which the State has some control over. Costs among the various utilities differ greatly--the State could choose to redistribute the allocation of reductions or their costs to levelize the impact and avoid some of the acute situations which are identified in this report. The State could change the manner in which capital investment enter a utility's ratebase to lessen the first-year price spike. The State could encourage the development of alternative SO2 reduction technologies. If the Congress determined that significant SO2 reductions were in the Nation's interest, Indiana's regulatory systems and institutions would be put to an important test. How it would choose to meet that challenge could greatly alter the results identified here.

Mr. **Packard**. There is no question that the coal industry is concerned about finding solutions for acid rain and other environmental concerns. And as we move the steel industry more and more into the coal process, which I think is a move in the right direction, obviously that may become a consideration of concern.

Mr. Chairman, in view of the time I will withhold any further questions.

Mr. **Volkmer**. If you have any others additional, you could put them in writing.

Mr. **Packard**. That's very true.

Mr. **Volkmer**. Congressman Traficant?

Mr. **Traficant**. Thank you, Chairman. One particular line of questioning that Mr. Packard was beginning to move into or perhaps at least brought some attention or at least brought my concerns to were, you know these other competing foreign countries did not have the type of steel base and the steelmaking capability that we had. They had to get those technologies from us, No. 1; and No. 2, in many cases we helped them to establish the competitive situation that exists for us, in areas where their standards of living are certainly not on par with us and where they can produce a product at less cost, which certainly down the line is going to become a problem for American or trade problems.

I'd like to know, Doctor, if the Congressional Research Service has ever done any studies or performed any studies relative to the large multinational corporation that has taken American profits from steel and aided the foreign steel development so that they could produce a product at lower costs and perhaps purchase that steel themselves as imports? Have you ever done that type of a study?

Dr. **Cantor**. No, I have not, sir. I am not sure that—again, if you will permit, I will determine this when I return to Washington from my colleagues, probably in our International Economics Section.

Mr. **Traficant**. I would like for you, if you will, to provide to the committee in writing any evidence of any information of any Government entity here in America that has studied the multinational corporation issue and whether or not it was American dollars that established the competitions that are now eating our industry alive. And, if you would, and you have evidence, of any information, any hearings, any testimony, any statements, any studies; please forward them, if you will, to the committee so that we can review that.

Mr. **Packard**. Would the gentleman yield for just a moment?

Mr. **Traficant**. Yes, I will.

Mr. **Packard**. Along that line, it would be helpful to know also, in providing that information, if the World Bank or the International Monetary Fund has been used to finance. You asked for multinational funding. I would be interested to know if any IMF or World Bank funding has been used——

Mr. **Volkmer**. Or Asian Development Fund, anything like that.

Mr. **Packard**. Government funding to assist in Third World or foreign country development of the steel industry.

Dr. **Cantor**. Yes, sir, I will be glad to research.

Mr. **Traficant**. I know that we have placed a little bit of a demand on you there but——

Dr. **Cantor**. That is my job, sir.

Mr. **Traficant**. Fine. Well we are going to be anxiously awaiting that information. I think a lot of people will be.

Mr. **Volkmer**. Just a moment. I will interject to say that we will hold the record open and give you time to provide that for the record.

[The material referred to follows:]

Congressional Research Service
The Library of Congress

Washington, D.C. 20540

April 6, 1983

TO :

FROM : Patricia Wertman
Analyst in International Trade and Finance
Economics Division

SUBJECT : Export-Import Bank Financing of Steel Plants

At your request we have examined figures supplied by your office presenting the Export-Import Bank's financing of steel capacity between 1945 and 1976. The material presented was taken as given (without rigorous verification) and compared to the listing of Ex-Im Bank credit authorizations of the five-year period covering FY1977 through FY1981. A few preliminary observations are possible.

1. The financing of steel plants appears to represent only a small portion of the credit authorizations which the Export-Import Bank made during the five year period. (See attachment 1). During this period steel-related authorizations amounted to $140.7 million out of a total direct credit authorization of $16.4 billion. (See Attachment 2)

2. About 42 percent of the $140.7 million is accounted for by one credit, a steel pipe production facility in Mexico for $58.5 million in FY1981.

3. The financing of steel plants may be a diminishing activity of Ex-Im Bank. The earlier data appear to cover the years 1945-1976 or 31 years. It includes all Marshall Plan aid by the Bank to Western Europe and to the

a total of $2.4 billion leaving approximately $2.1 billion expended over 31 years. If one makes the arbitrary and unlikely assumption that the money was expended in equal amounts over each year, then in the earlier time period the Ex-Im Bank spent about $68.3 million per year on the steel industry in developing countries. By comparison this figure for fiscal years 1977-1981 was $28.1 billion. However, these two figures are not comparable since the earlier figures included both loans and guarantees while the more recent figures include only direct credits. The later figure must be viewed as a minimum while the earlier figure is a maximum. Therefore, the conclusion concerning a decrease in the Ex-Im Bank role in financing steel plants abroad is at the very best only tentative.

4. There was, however, a dramatic increase in the financing of steel projects during FY1981, accounting for nearly 62 percent of the financings during the five-year period. As stated above this was largely accounted for by one plant.

5. The Ex-Im Bank does not appear to be extensively financing the development of foreign competition to our declining industries. The list of authorizations for the five year period is attached.

6. Tonnage capacity was not listed.

7. I was unable to locate any written policy statements that the Bank targets industries. However, a member of the policy analysis section of the Bank stated that the Bank does try to "prioritize the objectives of the Bank." It looks at historical trends, studies preliminary commitments that are lost, and does sector studies. James Cruse, Vice President for Policy Analysis (566-8861) may be the person to talk to on the issue. The Bank may be able to do computer run-outs of its loans to various industries. Robert F. Camp in the Bank's Credit Information is the person to contact (566-4690).

EX-IM BANK CREDITS AUTHORIZED FOR STEEL FACILITIES

Obligor (Guarantor in Parentheses)	Purpose, Rate and Terms		Amount
FY 1977			
Korea			
Pohang Iron & Steel Company (Korea Exchange Bank)	Const. of Silicon Steel Mill 8.500% Payable in 10 SA	Beg. 1-21-83	$17,910,000
Yugoslavia			
Boris Kidric Niksic (The Investment Bank of Titogra)	Expansion of Steel Works 8.625% Payable in 10 SA	Beg. 1-05-83	$7,000,000
		FY TOTAL	$24.910 million
FY 1978			
Argentina			
Acindar Industria Argentina (Banco Nacional De Desarrollo)	Increase in Financing for Expansion of Steel Facility 8.500% Payable in 11 SA	Beg. 5-31-84	$2,700,000
Brazil			
Companhia Siderurgica Paulista (Federative Republic of Brazil)	Increase in Financing for Expansion of Steel Mill 8.500% Payable in 11 SA	Beg. 11-01-79	$9,467,000
		FY TOTAL	$12.167 million
FY 1979			
Brazil			
Cia, Siderurgica Nacional (Federative Republic of Brazil)	Increase in Financing for Expansion of Steel Mills 8.000% Payable in 12 SA	Beg. 1-01-86	$882.000
Companhia Siderurgica Paulista (Federative Republic of Brazil)	Increase in Financing for Expansion of Steel Mills 8.000% Payable in 24 SA	Beg. 11-01-79	$1,683,000
		FY TOTAL	$2,565 million

Obligor (Guarantor in Parentheses) continued	Purpose, Rate and Terms		Amount
FY 1980			
Argentina			
Direccion General Fabricaciones Militares (Ministry of Treasury & Finance)	Increase in Financing for Steel Mill Expansion 8.125% in 7 Semiannual Installments Beginning 2-10-85		$2,565,000
Acindar Industria Argentina	Steel Mill Expansion 8.750% in 9 Semiannual Installments Beginning 3-15-86		$9,000,000
Brazil			
Companhia Siderurgica Nacional (Federative Republic of Brazil)	Increase in Financing for Phase III Steel Expansion Program 8.375% in 12 Semiannual Installments Beginning 2-10-86		$775,350
Campanhia Siderurgica Paulista (Federative Republic of Brazil)	Increase in Financing for Steel Mill Expansion 8.375% in 12 Semiannual Installments Beginning 2-01-86		$1,881,900
		FY TOTAL	$14.222 millio
FY 1981			
Algeria			
Societe Nationale de Siderurgie (Banque Algerienne de Developpement)	32-ton Open Hearth Furnaces (2) 8.750% Payable in 15 Semiannual Installments Beginning 9-30-84		$7,000,000
China (Taiwan)			
CCNAA-China Steel Corp. (CCNAA)	Steel Expansion Project 10.750% Payable in 16 Semiannual Installments Beginning 12-31-85		$19,500,000

Obligor (Guarantor in Parentheses) continued	Purpose, Rate and Terms		Amount
Mexico			
Tubos de Acero de Mexico, S.A.	Increase in Financing for Direct Reduction Steel Plant 9.750% Payable in 20 Semiannual Installments Beginning 6-10-83		$1,807,616
Tubos de Acero de Mexico, S.A.	Steel Pipe Production Facility 8.750% Payable in 20 Semiannual Installments Beginning 1-15-86		$58,500,000
		FY TOTAL	$86.807 million
		GRAND TOTAL	$140.671 million

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EXPORT-IMPORT BANK SUPPORT OF ALL STEEL-TYPE MATERIAL

	Export Value	Authorized Value
	(thousands of dollars)	
July 1, 1975 - June 30, 1976		
Steel foundry and fabrication equipment	28,804	28,945
Iron & Steel, unmanufactured	14,940	13,752
Steel Mill Plant & Equipment	112,628	76,296
October 1, 1976 - September 30, 1977		
Steel foundry and fabrication equipment	5,048	3,806
Iron and steel, unmanufactured	18,500	18,500
Steel mill plant & equipment	25,183	20,470
October 1, 1977 - September 30, 1978		
Steel foundry and fabrication equipment	19,183	14,782
Iron and steel, unmanufactured	7,000	7,000
Steel mill plant & equipment	182,458	140,687

Source: Export-Import Bank, August 30, 1983.

Patricia Wertman
Analyst in International Trade & Finance
Economics Division
September 2, 1983

THE RISE OF STEELMAKING IN THE DEVELOPING COUNTRIES

State Intervention In The Market And Its Effect On International Trade In Steel

Prepared For

BETHLEHEM STEEL CORPORATION

UNITED STATES STEEL CORPORATION

By

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1984

Executive Summary

This study examines the rise of modern steelmaking industries in developing countries during the past 15 years. In that time, steelmaking capacity in the developing countries (non-Communist nations) has more than tripled from about 28 million tons per year in 1970 to nearly 90 million tons per year in 1982. This growth was largely planned, financed, and directed by developing country governments with the assistance of extensive loans and technical assistance from the industrialized nations. Government and foreign aid has made possible the establishment of entirely new, modern integrated steelmaking facilities throughout much of the developing world -- a phenomenon which has had a significant impact on the world steel market.

Because of overinvestment in steel in Europe and Japan, and a leveling off of long term growth in world steel demand after the early 1970s, the steel industries of the industrialized nations were already suffering from the effects of excess capacity -- depressed prices, low operating rates, and trade friction -- when the new developing country steelmaking facilities began to come on stream in the late 1970s. The emergence of major steel producers in the developing countries had two significant effects:

- The export markets which the industrialized nations had traditionally enjoyed in the developing countries were substantially reduced as developing country governments imposed import restrictions to protect their new industries;
- The developing countries themselves emerged as significant exporters of steel products.

Developing Countries' Steel and the World Recession

The impact of the new developing country industries has become more pronounced since 1981, when a cyclical downturn in steel demand -- and a global recession -- began. As a result of major foreign borrowing to finance industrial expansion and energy consumption in the 1970s, many developing countries had accumulated debt levels which, with the rise in interest rates in the 1980s, became a crushing burden -- Brazil, for example, must now pay an estimated $17 billion per year merely to service its foreign debt. With domestic steel demand stagnant or declining, and facing a dismal balance of payments problem, the developing countries have had a powerful incentive to employ their underutilized new steel plants to produce steel for export -- and to export those surpluses, if necessary, by dumping or through the use of export subsidies. A surge of low-priced steel exports from the developing countries has buffeted the industrialized nations since 1981, depressing international prices and triggering a wave of trade complaints in Europe, Japan, Canada, Australia and the United States.

Developing Countries' Steel in the U.S. Market

The U.S. steel industry was already in a depressed condition when developing country steel imports began increasing sharply in the 1980s. Excess capacity in Japan and the EEC had led to successive episodes of dumping in the U.S. market in the years after 1975, which the U.S. attempted to alleviate -- with limited success -- with the trigger price mechanism, a system for monitoring and responding to dumping. After a series of protracted trade disputes, Japan restrained its steel exports to the U.S. in the late 1970s, and the European Communities entered into a restraint agreement with the U.S. in 1982. However, the U.S. industry had been substantially weakened by years of sales at depressed prices in its domestic market, which had deprived it of internal funds and retarded its ability to invest in new equipment. Moreover, the influx of low-priced steel from the developing countries struck the U.S. industry during the worst recession in domestic steel demand in decades -- depriving the U.S. mills of sales volume when it was most needed.

Penetration of the U.S. steel market by nations other than Japan, Canada and the EEC, labelled as "other country", a category dominated by the developing countries, increased from 4.1 percent in 1981 to 7.6 percent in 1983 and 10.2 percent in the first quarter of 1984 -- in that quarter "other country" imports accounted for 46 percent of all U.S. steel imports from all sources. U.S. firms' loss of market share to developing country imports was a major factor in their low rate of capacity utilization, which was under 50 percent in 1982 and about 55 percent in 1983 -- a phenomenon which has greatly increased unit costs of production and adversely affected profitability. The low price of developing country steel -- sometimes offered at extremely large dumping margins -- has severely depressed U.S. domestic prices.

The U.S. mills suffered a net operating loss of over $5 billion in 1982-83. While multiple factors contributed to these massive losses, price suppression and sales lost to developing country producers were a primary cause.

Distortion of the Market

The growth of steel industries in the developing countries is sometimes described as part of a global shift of steelmaking activity from the industrialized nations to the developing countries, which enjoy certain natural comparative advantages. It is argued that while industrialized nations might deplore this shift, the process is inevitable, given the nature of the comparative advantages which the developing countries enjoy.

In fact, however, very few of the developing country steel industries are economically viable. Virtually all have been created and sustained by their governments, and in a truly competitive in environment -- that is, absent government subsidies, protection from imports, loan guarantees and other forms of state aid -- a large segment of the steel industry in the developing countries would simply collapse. State backing, not natural comparative advantage, is proving to be the critical determinant of international competitive outcomes in this sector.

To be sure, developing country producers do enjoy significant natural comparative advantages, which, depending on the country, may include the proximity of abundant, low-cost raw materials and energy supplies. Virtually all developing countries enjoy low wage costs, although in many cases this advantage is partially offset by lower productivity per worker. While such advantages are usually cited as the primary factors underlying the growth of developing country steelmaking, a far more significant factor -- the pervasive role of the state -- has received less attention. Virtually all of the major developing country steel producers receive massive financial assistance from their governments, and a number of the leading producers -- in nations such as Mexico, Spain and Brazil -- could not maintain day-to-day operations without continuing infusions of state aid. In many cases these producers are being supported -- and assisted to expand capacity and export aggressively -- for reasons that are not related to normal commercial considerations, such as the desire for a return on investment. Developing country mills are subsidized to maintain domestic employment, for reasons of national pride and military preparedness, to sustain other industrial sectors, or simply because their collapse would have intolerable social and financial consequences.

In Brazil, Mexico, Venezuela and several other developing countries the steel export drive is also a function of the massive foreign debts which these nations have accumulated -- the foreign debt of both Mexico and Brazil now exceeds $80 billion. A significant portion of this debt represents loans from the banks of industrialized nations which were channeled into major developing country industrialization projects -- the foreign debt of Brazil's state steel holding company, for example, exceeded $7 billion by 1983. Having overinvested in steelmaking capacity, the developing countries and their creditors view the expansion of steel exports as partial way out of their present balance of payments difficulties. National currencies are being depreciated, and subsidies and other incentives granted, in an urgent attempt to increase export volume.

While the world steel market is suffering from grossly excessive capacity -- a phenomenon which has led to widespread dumping and economic dislocation in many parts of the world -- a number of developing countries are still pressing forward with aggressive new steelmaking capacity expansion plans. For example, although South Korea already exports nearly half of its steel output, the Korean government is now sponsoring the construction of a new integrated mill (Gwangyang) which will increase Korea's capacity by nearly 50 percent, adding an estimated 6 million tons per year in steelmaking capacity. The governments of Mexico and Brazil -- despite underutilization of their existing capacity -- are pressing ahead with further steel expansion projects.

Case Studies

This study examines the steel expansion efforts of several illustrative developing countries in detail, concentrating on those nations which are the leading developing country sources of U.S. imports. While the countries examined vary widely in geographic location, style of government, and comparative wealth, their experiences are in some respects similar. In each case the government decided in the late 1960s or early 1970s to undertake a massive expansion of the steel industry, and in each case the expansion was financed in significant, if not predominant part by the government and by foreign lending institutions. In each case, the industry expanded beyond the needs of the domestic economy (at least in some product lines) and in the 1980s, the industry has turned to exports to dispose of its surpluses. In nearly all of the cases, the government has reinforced this effort with export promotion measures such as export subsidies and currency devaluations.

A basic theme running through these cases is the comparatively subordinate role played by market forces in determining growth and international trade patterns. The industries have grown not because they represented attractive or even prudent investments, but because governments determined that they should grow. In most cases the industries expanded their exports not because of comparative efficiency or increased demand, but because governments have determined that exports must be expanded.

The case studies examine those developing countries which, collectively, have accounted for the bulk of U.S. developing country steel imports. With the exception of Brazil and South Korea, the share of U.S. steel consumption which is accounted for

SURVEY OF LEADING DEVELOPING COUNTRY EXPORTERS OF STEEL TO THE U.S. MARKET

	Principal State-Owned Producer(s)	Production of Crude Steel (Million m/tons)			U.S. Imports of Steel Products (ooo n/tons)			
		1972	1978	1982	1970	1975	1980	1983
Brazil	COSIPA CSN USIMINAS	6.5	12.2	13.0	19	43	458	1,257
South Korea	Pohang Iron & Steel Co.	.6	5.0	11.7	27	397	1,040	1,728
Taiwan	China Steel	.5	3.4	4.1	34	36	86	177
Spain	Ensidesa AHM	5.2	11.3	13.1	42	158	462	610
Mexico	AHMSA SICARTSA Fundidora	4.4	6.7	7.1	190	51	67	651
South Africa	Iscor	5.3	7.9	8.2	74	11	440	559
Argentina	SOMISA	2.2	2.8	2.9	119	4	18	283
Venezuela	SIDOR	1.1	.9	2.2	----	----	73	157
Poland	Katowice Lenin (Nowa Huta)	13.4	19.3	14.8	90	72	119	77

by imports from each of these nations individually has historically been comparatively small (although this is rapidly changing). However, when the import totals from all of the developing countries are cumulated they constitute the largest and most rapidly growing segment of U.S. steel import volume, and their collective impact on the U.S. market is now greater than that of steel from either Japan or the EEC.

- Brazil: As a result of a massive government backed expansion program, Brazilian steel capacity more than tripled between 1973 and 1984, from 7 million tons to over 20 million tons. This effort was accomplished, despite chronic massive losses of the state-owned steel enterprises, with the aid of well over $10 billion in government subsidies, government loans and government-guaranteed foreign loans. By the time Brazil's new capacity began coming on stream, however, Brazilian domestic steel demand was declining precipitously, and Brazil's foreign debt burden had become virtually intolerable. Brazil began utilizing its surplus steelmaking capacity to produce steel for export in an effort to improve its balance of payments, and the government stimulated exports with heavy subsidies and a "maxidevaluation" of the cruzeiro. Dumped and subsidized Brazilian steel has severely disrupted the U.S. steel market and triggered trade friction and trade complaints in many other parts of the world. Brazil has continued to press ahead with additional steel capacity expansion projects despite the world steel glut and its own growing "overhang" of surplus steelmaking capacity.

- South Korea: Within the space of one decade, the South Korean government has built up a major steel industry through a combination of government financial aid, foreign assistance, and protection from imports. Primarily as a result of the integrated steelworks built in the 1970s by the state-owned Pohang Iron and Steel Company (POSCO), Korea now possesses substantially more capacity than is needed to satisfy its domestic demand, and is pressing ahead with further ambitious capacity expansion plans. Korea, which heavily protects its own domestic steel market, has operated its mills at full or nearly full capacity utilization, thus greatly reducing unit costs, and sold its growing surpluses abroad, aided by various export subsidies and export stimulating measures. Such government aid has reinforced important natural advantages enjoyed by the Korean steel industry -- most notably low labor costs and a motivated work force -- and has enabled Korean steel to achieve a substantial and growing penetration of the international market. Korean steel imports were a significant factor in depressing U.S. domestic prices in 1982 and 1983. South Korea exports more steel to the U.S. than any other developing country, and now accounts for about 2 percent of all U.S. domestic consumption.

- Spain: In response to government initiatives, the Spanish steel industry undertook a vast expansion program in the late 1960s and early 1970s, with the result that by the mid 1970s, with domestic demand mired in a deep slump, the industry possessed about twice the capacity needed to satisfy domestic demand. Since 1978, the collapse of the integrated steel industry has been averted only by a series of government bailouts, which have led to the progressive nationalization of the sector -- and correspondingly, the increasing politicization of steel issues. Despite the fact that Spain's excess steelmaking capacity has been a major factor underlying the industry's unbroken succession of operating losses, capacity cutbacks have proven so politically volatile that only limited reductions have been undertaken to date, and even these have proven highly controversial. Spanish steelmakers have continued to operate their mills at high levels of utilization, maintaining employment levels and exporting their surpluses at low prices. The ailing Spanish steel industry has thus become the eighth largest exporter of steel in the world.

- Mexico: Chronically unable to meet its domestic steel needs, Mexico launched an ambitious capacity expansion program in the early 1970s, funded by government equity investments and loans and by foreign loans. This program accelerated with Mexico's petroleum boom in the late 1970s, and when that boom collapsed in 1981, Mexico was burdened with a foreign debt of over $90 billion and a steel industry which possessed excess capacity in a number of product lines (although overall it could still not fully meet Mexico's domestic needs). The government continually injected new funds into the financially troubled steel industry and encouraged it to export its surpluses to the U.S. as a means of maintaining employment and improving the balance of payments. Between 1982 and 1983, the volume of Mexico's steel exports to the U.S. increased by nearly 600 percent.

- South Africa: The South African steel industry is dominated by the government-owned producer, Iscor, which accounts for about three-fourths of the country's steel production and steel exports. Iscor engaged in a massive capacity expansion program in the early 1970s, funded by a combination of government equity investments and heavy foreign borrowing (much of it facilitated by government loan guarantees). The South African government imposed a de facto ban on most steel imports in 1975; that fact, coupled with Iscor's monopoly or near-monopoly on a number of major product lines, ensured comparative stability in domestic steel prices (except for a brief period in 1982-83). Although the government has maintained steel price ceilings, since 1978 it has relaxed them, permitting price increases steep enough to provoke an outcry from South African steel consumers. At the same time, South African steelmakers have operated their facilities at high utilization rates, exporting their growing steel surpluses at prices below domestic levels. In effect, by adopting policies which restrict competition in its domestic market, the South African government has caused domestic steel consumers to subsidize South African price competition in export markets.

- Taiwan: The government of Taiwan established the China Steel Corp. (CSC) in 1971 to contruct the nation's first integrated steelworks. Because no private investment could be attracted, the CSC ultimately became wholly government-owned, and the new steelworks was financed largely by contributions from governmental and quasi-governmental institutions. The CSC mill, which became operational in successive stages beginning in 1977, was characterized by state-of-the-art steelmaking technology, and a dedicated work force. As its capacity came on stream, the government imposed stringent restrictions on imports and extended the firm subsidized credit and additional equity contributions to finance its continuing expansion. CSC operated its facilities at a utilization rate of 100 percent or more of nominal capacity; since this often produced a substantial surplus, the excess production was exported at prices which were generally lower than domestic prices.

- Argentina: In 1974 the Argentine government set a goal for the national steel industry of producing 15 million tons of steel by 1985 (actual Argentine consumption in 1982 was 2.5 million tons). Although this goal was never achieved, a succession of government grants and loans and foreign loans enabled the Argentine industry to install capacity which, by 1980, exceeded Argentine consumption levels by approximately 100 percent. Burdened with surplus capacity, a huge foreign debt, and declining domestic steel demand, Argentina has urgently sought to forestall steel imports and to expand steel exports (with the U.S. market as a primary objective) through a variety of export incentives, export subsidies, and devaluations of the national currency. The volume of U.S. steel imports from Argentina in 1983 was four times greater than the average for the years 1979-82.

- Eastern Europe: In the 1970s, the communist governments of Eastern Europe channeled resources into the expansion of their steel industries, in most cases as a national priority. In the 1980s a number of these countries (such as Romania and Poland) are suffering from an extremely heavy foreign debt burden and are using steel exports as a principal means of obtaining foreign exchange to improve their balance of payments position. Because of the government-controlled nature of these nations' foreign trade, their export patterns have been erratic, characterized by sudden surges of low-priced steel, reflecting imperatives such as the need for foreign exchange.

Conclusion

The cases presented in this study are not atypical of the developing steelmaking phenomenon as a whole. The expansion of steelmaking capacity implemented by developing country governments over the past 15 years has contributed substantially to the global capacity surplus, and dumped and subsidized developing country steel has become a major factor in the trade problems of this sector. Government intervention in the market has been so pervasive, and its effects so significant, that in the steel sector, the market can no longer be said to be functioning as the primary determinant of either investment or trade patterns.

In an environment in which government policies -- level of subsidization, exchange rate manipulations effectiveness of import barriers -- are determining outcomes, a U.S. response which relies on market forces alone to resolve the problems of this industry will almost surely result in the continued erosion of the U.S. industry's production capability and efficiency.

1. Financial Assistance

The ambitious steelmaking expansion projects launched by the developing countries in the 1970s could never have been financed by domestic entrepreneurial capital. Even in those nations -- such as Brazil -- where the private sector possessed substantial resources, no private investor or group of investors would have been willing to commit hundreds of millions of dollars to projects which entailed such high risks as the establishment of a greenfield integrated steel mill.[39/] Accordingly, in every developing country, the state was required to assume the primary role of provider -- either direct or indirect -- of capital.[40/]

Developing country governments extended financial assistance to their steel enterprises in a number of basic forms. They provided equity capital, purchasing shares in the state enterprises with public funds; as the enterprises have encountered periodic financial difficulties, governments injected new funds in the form

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[39/] Brazil's 1972-75 Phase II expansion plan, for example, was financed by the state steel companies themselves, by the government, and by the World Bank. Private investors were not seriously considered because the chronically poor financial history and prospects of the state-owned firms made them unattractive investments. Even the World Bank refused to participate in South Korea's Pohang Iron and Steel Project, which it regarded as an investment that would not prove commercially viable. On October 11, 1979 American Metal Market noted the comment of the President of SIDERBRAS, Brazil's state steel holding company: "'Why do we insist on creating the large steelworks?' he asks, rhetorically. The large mill is so expensive only the state has the means to finance it, he said."

[40/] Specifies about national subsidy programs are provided in Part III., "Case Studies."

of "additional subscriptions to capital." Governments also provided a continuing flow of low-interest loan capital to the steel enterprises; government development banks made loans at low or negative interest rates, and, in some cases (*e.g.*, South Korea), government control of the commercial banking sector enabled the government to channel low interest private loans to the industry.[41] In addition, developing country governments employed a variety of fiscal and tax measures to improve the financial posture of their steel industries.[42]

Such assistance was important in its own right, but it was also a factor in attracting foreign capital to the steel projects. Government equity participation -- and the assurance of continued government loans -- was important factor in securing commitments by international development banks and commercial syndicates to participate in the projects.[43] Moreover, developing country governments usually guaranteed the foreign loans -- and without such guarantees, it is doubtful in many cases whether foreign debt capital could have been raised. In 1981 the U.S. General Accounting Office noted with respect to Brazil's plan to establish a new greenfield integrated steelworks, ACOMINAS, that would become the largest in Latin America,

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[41] Part III. B. In Brazil and Mexico, the chronic liquidity problems of the state steel enterprises led the government development banks to convert increasing amounts of their debt into equity in the firms. Part III.A. and C.

[42] Special tax depreciation allowances have been granted to steel producers, and in some cases, such South Korea, the state steel enterprise has (until 1982) been totally exempt from corporate income tax. Reductions of import duties and taxes have been granted to lower the cost of imported steelmaking equipment and raw materials.

[43] See Part II.B.1., *infra*.

> The project is being financed with full and unconditional guarantees of the Federative Republic of Brazil. Such a guarantee is probably essential to attract foreign financing because of the unlimited risks involved in such a huge venture.[44]

Once the steel plants became operational, developing country governments undertook a wide variety of measures to ensure that their steel exports were price-competitive internationally. The most common measures included the provision of subsidized government loans to cover the cost of steel produced for export, tax exemptions for exported steel, and devaluation of the national currency, sometimes on a selective basis, in a manner designed to enhance the price-competitiveness of exported steel. In addition, in many cases operating losses were directly subsidized.

Significantly, while the various financial aid measures undertaken by developing country governments constitute major competitive advantages for their producers, many of them cannot be countered by the U.S. trade laws.[45] Government equity

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44/ GAO, New Strategy Required for Aiding Distressed Steel Industry (January 8, 1981) p. 5-21.

45/ The existing international rules regarding export subsidies are less effective than U.S. unilateral trade remedies. Article 14(4) of the GATT Subsidies Code provides that "there shall be no presumption that export subsidies granted by developing country signatories result in adverse effects, as defined in this Agreement, to the trade or production of another signatory." The practical effect of this provision has been largely to preclude the use of international dispute settlement procedures to challenge export subsidies by the developing countries. T.R. Graham and S.J. Rubin, "U.S. Trade Policy Toward Developing Countries," in Graham and Rubin, ed., Managing Trade Relations in the 1980s (1984), pp. 155-57.

injections into steel enterprises are not subject to the U.S. countervailing duty laws unless they are "provided on terms inconsistent with commercial considerations," a standard which is applied with considerable leniency.[46] Recent decisions by the U.S. Commerce Department have held that non-market economies such as those of Eastern Europe -- a substantial source of U.S. steel imports -- are inherently incapable of granting subsidies and are therefore not subject to the U.S. countervailing duty laws.[47] Similarly, the Commerce Department takes the position that a devaluation of the national currency -- one of the most common devices employed by developing countries to stimulate exports -- does not constitute a countervailable subsidy.[48] While currency deevaluations specifically designed to produce an export surplus may or may not be regarded as objectionable,[49] they nevertheless represent government measures which create a competitive

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[46] In most cases, government equity injections are inconsistent with commercial considerations. They are made because private capital cannot be raised -- commercial investors are unwilling to take the risks and are dissatisfied with the prospect of a low or negative return on their investment. In Taiwan, South Korea, South Africa, Brazil and many other countries, governments have tried unsuccessfully to attract commercial equity investment to national steel projects, and have ended up supplying most of the equity themselves. In some cases, such as South Korea and South Africa, dividends have not been paid on government equity shares for many years. The Commerce Department, however, generally treats government equity injections as consistent with commercial considerations until a firm has developed a history of heavy losses and poor return on equity. See, e.g., *Certain Carbon Steel Products from Brazil* (final), No. C-351-021; *Certain Carbon Steel Products from Mexico* (final), No. C-01-18.

[47] Commerce has ruled that "subsidies have no meaning outside the context of a market economy....a 'bounty or grant; within the meaning of the countervailing duty law, cannot be found in an NME [non-market economy]." *Carbon Steel Wire Rod from Poland* (final), No. C-455-003, May 1, 1984, pp. 6, 20. The Polish journal *Zycie Gospodarcze* offered a different perspective on December 13, 1981, acknowledging that "[S]ubsidizing [exports] violates the GATT resolutions signed by us. It is possible, however, to circumvent these regulations by using various kinds of loopholes -- a return of profits from intermediary stages of production, a return of import tariff and turnover tax, and subsidizing not exports but unprofitable enterprises." For a description of Polish subsidies and export promoting devices, see Part III.H. *infra*.

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[48] In United States v. Hammond Lead Products, Inc., 440 F.2d 1024, 1030 (1971), cited by the Commerce Department as authority for refusing to impose sanctions on countries which devalue their currencies to stimulate exports, the court stated that "Nothing, at least in the short range, stimulates exports more than a devaluation of the currency....Yet we do not assess countervailing duties against countries because they devalue their currencies. Why not? The only valid reason is that these devaluations have been encouraged by our government, in the effort it has expended since Bretton Woods for a worldwide system of freely convertible currencies." The developing countries have in some cases (China, Brazil) devalued their currencies to stimulate desired exports, then imposed taxes on the export of certain primary commodities (such as foodstuffs and raw materials) whose export the government did not seek to stimulate. This device has channeled the effect of the devaluation into the sectors where export promotion was sought, e.g. manufactured commodities such as steel. (Announcement of Chinese Customs on the Imposition of Export Tariffs on 34 Commodities, June 1, 1982; Gazeta Mercantil, February 21, 1983). U.S. law treats selective devaluation -- that is, devaluation of the currency for one product, but not another -- as a countervailable subsidy. However, the Commerce Department recently ruled that with respect to Brazil, the simultaneous devaluation of the national currency and selective imposition of export taxes did not constitute a selective devaluation or a countervailable subsidy. Certain Carbon Steel Products from Brazil, op. cit., p. 24.

[49] A number of recent devaluations have been undertaken pursuant to austerity measures prescribed by the International Monetary Fund, and have been explicitly designed to foster an improvement in the balance of trade to alleviate the burden of foreign debt. However, it should be noted that the Articles of Agreement of the IMF, a multilateral agreement, provide that signatories should not seek to achieve a trade advantage over other nations through devaluation of the currency. Article I (iii) of the IMF Agreement provides that among the purposes of the IMF are "to avoid competitive exchange depreciation." Article IV(iii) of the Agreement provides that one of the general obligations of the members

FOOTNOTE CONTINUED

advantage for foreign producers unrelated to gains in efficiency or productivity. U.S. producers must directly confront developing country competitors which enjoy government financial and fiscal aid measures designed to enhance their price competitiveness which cannot be offset by application of the U.S. trade laws.

2. Protection

Government protection from imports has formed an essential element in the growth of steel industries in the developing countries in the 1970s and 1980s. Because steel products are basic commodities essential to industrial development, no developing country can restrict steel imports altogether -- national steel industries can never produce the entire array of steel products needed by the economy. Instead, protection is generally extended to those product lines which the national industry is able to produce in sufficient quantities -- and as the developing country steel industries have grown, protection has spread to an increasing number of product categories.50/ Thus, as Nigeria's President Shagari opened the nation's first

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50/ For example, in 1981 Taiwan's state-owned China Steel Corporation (CSC) developed the capability to produce certain high-grade steel slats and rods. The Taipei China Post reported on August 24, 1981 that "it is expected that after the firm begins producing such products locally, the government will probably impose import restrictions on similar products from abroad." As CSC's hot-rolling and cold-rolling facilities came on stream, the Taiwanese government imposed import licensing requirements on hot coil and cold-rolled sheets that amounted to a virtual ban. Metal Bulletin, September 25, October 5, 1982.

Figure 10

GOVERNMENT PROTECTION OF THE DOMESTIC STEEL INDUSTRY IN DEVELOPING COUNTRIES IN 1982

Country	Protective Measures
Argentina	Import license granted only if product not produced domestically or in short supply.
Brazil	State steel holding company (SIDERBRAS) must approve all import transactions.
Mexico	Import license granted only if product not locally produced, in short supply, or available on highly unfavorable terms.
Venezuela	Import of all steel products prohibited or reserved for imports required for government projects.
South Korea	Import of most steel products which are domestically produced subject to prior approval of Iron and Steel Industry Association.
India	Import of some product categories banned altogether; others on "restricted list" others may be imported only by one agency (Steel Ministry of India).
Taiwan	Import of products which are also produced domestically is subject to prior approval of the state steel enterprise.
Zimbabwe	Import of any product made by the local producer (Zisco) is prohibited.
Colombia	Import licenses required. Import of some steel products is prohibited.
South Africa	Import licenses required. *De facto* ban on virtually all imports of steel products which are made domestically.

steel mill in 1982, he stated that

> Nigeria would no longer be a dumping ground for the cheap steel products of other countries.... [A]s soon as our steel products [are] ready for the market, policy measures on steel imports, pricing and distribution [will] be put into effect to safeguard the interests of the nation and the employment of thousands of Nigerians for whom an efficient and viable steel industry holds out so much promise.[51]

The growth of steel production capability in the developing countries has thus been accompanied by a progressive closure of markets that were once major outlets for steel produced by developed nations.[52] As one Japanese newspaper commented in 1983,

> Steel material import restrictions on such items as rods have spread among Southeast Asian countries. Over the last year and this year, Korea, Taiwan, Malaysia and Indonesia, one after another, have hammered out strict import restriction policies. Because of the worldwide economic depression, they are attempting to protect their own steel manufacturing companies from the offending import products. With their increasing ability to supply their own needs from new facilities, and the lack of foreign currency in developing countries, import restrictions have had a tendency to spread to even oil producing countries like Nigeria and

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51/ Kaduna *New Nigerian*, January 30, 1982.

52/ *Metal Bulletin* reported on March 16, 1979 that as Brazilian steelmaking capacity came on stream, Japan was losing its export market in Brazil, product line by product line. "In Brazil, steel imports are limited to products which are not produced locally.... In the case of heavy plate...Brazil is itself an exporter. HR sheets can also be supplied from local sources with imports of the latter product only needed on an *ad hoc* basis when supplies are tight.... ACESITA has recently installed plants to produce [stainless steel sheet and electrical sheet] and therefore imports are likely to fall as domestic capacity is brought into the market."

> Mexico...[T]he President of the Tokyo Steel Co. said that among Southeast Asian countries, the only market to which we can export is Singapore.[53]

Protection has generally been implemented through a government authority which screens all proposed import transactions, usually in consultation with the national steel producers. In Brazil, for example, imports considered "superfluous" are prohibited altogether and all other imports are subject to the discretionary grant of import licenses by CACEX, the foreign trade department of the Bank of Brazil.[54] Proposed steel imports must be approved by SIDERBRAS, the state-owned holding company that controls much of Brazil's steel production.[55] Thus, in Brazil as in many other developing countries, the domestic steel industry controls access to its own home market. At the same time, developing countries like Brazil have continued denounce antidumping and countervailing duties imposed by the U.S. and the

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[53] Nikkei Sangyo, April 2, 1983; see also Nippon Kogyo, August 12, 1982; Nikkei Sangyo, May 24, 1982. Malaysia imposed an "indefinite ban" on imports of steel bars on November 25, 1982; Metal Bulletin reported (November 30, 1982) that a government spokesman indicated the ban was necessary "to ensure the healthy development of the domestic steel industry, which had been threatened by 'dumping' on the part of major foreign producers."

[54] Brazil's government policy toward steel imports has consistently been one of maintaining "prudent protective measures in the case of imports" (Minister of Industry and Commerce in O Globo, May 25, 1971). SIDERBRAS possesses the authority to prohibit "unnecessary" steel imports. Steel importers cannot seek Central Bank authorization of a proposed import transaction without obtaining prior clearance from SIDERBRAS.

[55] In addition to those measures, Brazil has imposed a 25 percent "financial operations tax" on imports and temporary tariff increases, to a maximum of 205 percent ad valorem.

EEC as "protectionist" measures taken to protect "noncompetitive" steel industries.[56] A Rio de Janeiro newspaper editorialized in 1982 that

> Brazil's import policy is now highly protectionist, of course, just what President Figeuiredo and economic area officials have been complaining about in the industrialized world. But there is a big difference between a developing nation such as Brazil closing its doors to imports and an economic giant such as the United States or Japan cutting off imports from desperate and needy third world nations. The industrialized world must understand the great need for access to markets that most developing nations face. Protectionism in industrial nations is a selfish attempt to keep specific unproductive sectors afloat. Protectionism by developing nations is often the only way for the entire nation to remain solvent.[57]

Government protection is being extended not only in "desperate and needy" countries, however, but in East Asian nations with steel industries that are generally regarded as highly competitive internationally. South Korea's steel industry, for example, has long enjoyed a protected home market as a result of government restrictions on steel imports. South Korea permits imports of all products unless they are on the list of "restricted import items," which corresponds with the product lines produced by South Korean steelmakers. Most major steel product lines, including sheets, plates, and bars are "restricted import items" (Figure 11) and can only be imported if approved by the Ministry of Commerce and Industry on the recommendation of the Korea Iron and Steel Association, which represents South Korea's steel manufacturers. The Steel Association issues periodic "recommendations" fixing import quotas for each major steel product category.[58] Thus, as in Brazil, the national steel industry effectively controls access -- the "window"[59] -- to its own domestic market. An official of the Korean Institute of Development Planning commented with respect to the policy of protection that

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[56] While trade sanctions imposed by the U.S. are criticized as protecting a "noncompetitive" industry, LDC protective measures are often justified on the grounds that they are essential to prevent destruction of their own steel industries through exposure to international competition -- as one Argentine steel official put it in 1978, import liberalization "would certainly wipe the Argentine industry off the map." Review of the River Plate, June 23, 1978.

[57] Latin American Daily Post, September 30, 1982.

> [T]rade liberalization is not an adequate solution to the problem [of unmet domestic steel demand] due to its various side effects.... [B]y letting our iron and steel demand remain at the mercy of external forces, we will become susceptible to the possible ills experienced in other countries, thus allowing our economy to fluctuate at their whims.[60]

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[58] The Korea Herald reported on January 16, 1981 that the Korea Iron and Steel Association had issued its regulations for the first half of 1981 fixing import quotas on steel products. The quotas were: hot coil, 50,000 tons; tinned plates and sheets, 25,000 tons; seamless tubes and pipes of alloyed steel, 1500 tons; billets of alloy steel, 7500 tons; coils for rerolling of high carbon steel, 25,000 tons; seamless pipes and tubes, 800 tons; and coils of stainless steel, 25,000 tons.

[59] Nikkei Sangyo, April 2, 1983. A recent study prepared for the Korean Iron and Steel Association states that "unlike many other foreign steel producers, Korea does not restrict imports of steel products." International Business and Economic Research Corporation, Korean Steel in Perspective.

[60] Chong Hyon Nam, Characteristics of the Iron and Steel Industry and its Supply and Demand Structure (June 30, 1979).

Figure 11

SOUTH KOREAN STEEL IMPORT RESTRICTIONS, 1982

Product	Restrictive Measure
Cold rolled sheets	Subject to recommendation of Korean Iron and Steel Association.
Hot rolled sheets	Subject to recommendation of Korean Iron and Steel Association.
Plates	Subject to recommendation of Korean Iron and Steel Association.
High carbon alloy steel	Subject to recommendation of Korean Iron and Steel Association.
Bolts and nuts	Subject to recommendation of Korean Iron and Steel Association.
Bars and rods (excluding wire rod)	Subject to recommendation of Korean Iron and Steel Association.
Cold rolled sheets, tinned, between 0.15 mm and .05 thickness	Subject to recommendation of Korean Iron and Steel Association.
Wire rod of alloy steel (excluding stainless steel, high carbon, or heat-resisting)	Subject to recommendation of Korean Iron and Steel Association.
Silicon steel sheets under 3 mm	Subject to recommendation of Korean Iron and Steel Association.
Hoop and strip of silicon steel	Subject to recommendation of Korean Iron and Steel Association.
Stainless steel wire 0.2 mm to 5.0 mm	Subject to recommendation of Korean Iron and Steel Association.

As is typical with many developing countries, South Korea has employed import restrictions to protect new steelmaking operations with major export potential. For example, in 1980 Korea's Inchon Iron and Steel Company began construction of a rolling mill to produce Korea's first H-beams, a key steel product used in major construction projects. The company planned to sell one-third of its output in the domestic market, "enabling Korea to save an annual $60 million in foreign exchange which it has been paying to import the product." The other two-thirds of the production volume would be exported.[61] Inchon's mill came on stream in early 1982, and the Korean government promptly imposed a ban on imports of H-beams from Japan, Korea's principal supplier, to continue in force until the new mill was in full scale production.[62] The Japanese government protested this action vehemently, to which a South Korean government spokesman reportedly responded that

> Japan had taken similar action against imports from the USA when its steel industry was developing.[63]

61/ Korea Herald, February 17, 1981.

62/ The Japanese newspaper Nikkei Sangyo commented on April 2, 1983 that "Because of the operation of the new facilities, the Korean government took certain measures on import regulation.... it was recommended that the same sized Japanese import of H-type steel be regulated as an import item designed by the window of the [Korean] Steel Association."

63/ Metal Bulletin, July 13, 1982.

B. Foreign Assistance

During the 1970s and 1980s the industrialized nations have poured tens of billions of dollars in capital into the expansion of steelmaking in the developing countries, and have provided them with modern equipment, technical assistance, and training.[70] Developing country governments and their foreign aid benefactors have developed mutually reinforcing relationships which have facilitated this process (Figure 12). Developing country governments have sought capital and equipment from foreign lenders and suppliers, who have in turn sought assurances that the government will provide guarantees for their investment -- in the form of matching government equity investments, loan guarantees, subsidized credit, protection from imports, infrastructural improvements, and government oversight of the industry's operations. As one observer commented in the *Southeast Asia Iron and Steel Institute Quarterly* (April 1980):

> Such government measures have made investments in LDCs considerably more attractive, in many cases, than investment in the United States. Very often governments, both national and

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[70] Foreign assistance is usually rendered in a "package" which includes financial aid, equipment, training, and infrastructure improvements. For example, West Germany extended substantial assistance to Indonesia for the construction of the Krakatu integrated steelworks, which was begun in 1974. Klockner, a German producer, constructed a deepwater port, a water supply system, and a communications system for the mill. Equipment was provided by Ferrostahl, Siemens, and other German firms. Export credits were granted by the Deutsche Bank to finance the export of this equipment to Indonesia; in 1979, the Deutsche Bank advanced credits of 500 million Deutschmarks to finance the acquisition of Krakatu's hot strip mill from Ferrostahl. *Harian Umum Ab*, May 21, 1979; *Suara Karya*, December 23, 1976.

Figure 12

ROLE OF DEVELOPING COUNTRY GOVERNMENTS AND FOREIGN INSTITUTIONS IN ESTABLISHING STEEL INDUSTRIES

	Developing Country Government	International Development Banks	Foreign Private Commercial Banking Syndicates	Foreign Export-Import Banks	Foreign Equipment Suppliers
Equity Capital	Provides equity contribution	Seeks assurances of government equity contribution	--------	-------	Occasional participation
Domestic Loans	Provides low interest loans	Seeks assurances of government loans	--------	-------	----------
Foreign Loans	Guarantees loans	Provides loans and helps arrange private financing	Provide loans	Export financing	Occasional loans in connection with equipment financing
Protection from Imports	Provides protection	Benefits from from protection	Benefits from protection	Benefits from protection	----------
Infrastructure	Provides needed improvements	May provide loans	May provide loans	--------	May assist with infrastructure improvements
Steelmaking Equipment	May subsidize purchases of domestically made equipment	------------	--------	Export financing for equipment	Provide equipment
Export Subsidies and Incentives	Provides subsidies and incentives	May seek incentives to ensure repayment	May seek incentives to ensure repayment	May seek incentives to ensure repayment	----------
Planning and Technical Aid	Provides central planning for industry	Seeks coordinated government planning	--------	--------	Provide technical and planning assistance

> provincial, will be in there bidding with tax holidays, infrastructure provision, favorable power and freight rates, protection against imports, preferential government purchasing policies and the like....

The partnership between foreign investors and developing country governments has thus served to increase both the volume of foreign aid to the steel industries and the direct role of the developing country governments in planning, subsidizing, and protecting their steel industries.

1. The Role of Foreign Banks

The financing of the rapid growth of the steel industries of the developing countries in the 1970s in the 1980s was not solely a function of government aid -- a major, if not equally significant role was played by Western lending institutions, which extended tens of billions of dollars in loans to the developing countries to finance the construction of new steel plants. These loans were advanced on terms far more favorable than those available to U.S. steel producers, and were instrumental in the developing countries' ability to import and install state-of-the-art Western steel production equipment. In most cases the developing country government was required to guarantee repayment of the loan, since the steel projects were so risky.

The Western loans to developing country steel industries formed an important component of those nations' rising debt to Western banks, which was, by the early 1980s, placing a crushing repayment burden on many debtor nations. The need to service these debts with income generated from the new plants has been a driving force behind the developing countries' urgent efforts to expand exports in the 1980's -- indeed, the 1983-84 surge in developing country steel exports to the U.S. is in significant part attributable to this phenomenon.

a. Export-import Banks

One major form of Western bank financing of steel plant expansion in the developing countries arose out of the developed nations' competition to sell capital equipment to the developing countries. When the world steel recession developed in 1974, a number of leading steel producers in the industrialized nations began to see the export of production equipment to the developing countries as a means of offsetting the slackening demand for steel products. Competition among Western nations to sell such equipment to the developing countries has intensified, and export financing by national export-import banks has played a critically important role in determining which nation will win a particular bid.71/ The developing countries have found that they can secure extraordinarily favorable financing for new steel plants simply by playing off Western countries' export financing institutions against each other.

71/ France, for example, has been aggressive in offering favorable terms for financing steel equipment exports. Japanese steelmakers -- who have competed with the French for some projects -- reportedly said of the French that "The President rushes in, carrying a bag filled with funds" (Nihon Keizai, June 18, 1981).

Between 1977 and 1980, an estimated $7.8 billion in export credits were advanced by Western government institutions to finance steel projects in the developing countries (Figure 13). This outflow of debt capital continues unabated today -- in the past five years, every major world steel project, with the exception of those undertaken in the U.S. -- has involved export credit financing, usually on extremely favorable terms to the buyer.[72] While the OECD maintains "consensus" interest rates designed to fix minimum interest rates for export financing, those rates are frequently undercut in practice in the intense competition to win export contracts -- thus enabling developing countries to obtain capital for expansion projects at far below market rates.[73]

The recent international bidding competition over equipment for South Korea's Gwangyang Steel Project illustrates how this process works. The Koreans had learned in the 1970s that Western export financing institutions could be played off against each other to drive down the cost of acquiring steelmaking equipment.[74]

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[72] U.S. Export-Import Bank staff. The Mexican SICARTSA project received financing from Japan and England at interest rates of 3 percent over a 20 year term. Ibid.

[73] The Export-Import Bank of Japan (a nation with low domestic interest rates and inflation) has always offered rates beneath the OECD consensus rates. Thus when the consensus rate was 10.7 percent in 1983, Japan's rates were about 8.1 percent. Moreover, in the international competition to obtain contracts, the Japanese rate is often itself undercut.

[74] When the first Pohang integrated steelworks was being built, the Koreans solicited competitive offers among several nations for the sale of equipment. As a result, Korea obtained financing at far below market rates. Korea Herald, February 18, 1981.

Figure 13

DEVELOPING COUNTRIES STEEL PROJECTS FINANCED BY OFFICIAL EXPORT CREDIT[1]

(Export Value By Lending Country In $ Millions)

Country	1977	1978	1979	1980	Total 1977-1980
U.S.	115	21	326	318	780
Japan	108	760	883	132	1,883
West Germany	3	567	38	2,561	3,169
France	184	13	70	370	637
Italy	101	235	663	25	1,024
Other	15	48	272	-0-	335
Total	526	1,644	2,252	3,406	7,828

1/ Excludes Communist countries.

Source: U.S. Export -
Import Bank

The risk to lenders was substantially reduced since repayments was guaranteed by the government of Korea.[75] In early 1983 South Korea's government-owned Pohang Iron and Steel Company (POSCO) invited bids for a new greenfield integrated steel mill at Gwangyang Bay, with an eventual capacity of 12 million tons per year.[76] As had become the customary practice,[77] the Koreans invited certain companies to bid on specific components of the project, and as the companies drew up their bids, the national export-import banks (or their equivalent) prepared financing packages for each bidder.[78] In December 1983, a heated competition erupted as the various export-import banks sought to undercut their foreign rivals in offering favorable terms to the Koreans.

U.S. companies had been asked to bid on three contracts -- oxygen separation equipment, raw materials handling equipment, and motors for the mill. The U.S. Export-Import Bank ("Eximbank") prepared two comparatively conservative financing options to encourage these exports, both of which did not go below the OECD consensus rate.[79] On December 20, 1983, however, Eximbank learned by telex that Voest-Alpine of Austria was offering financing to the Gwangyang project at 6.25 percent with a 20 percent aid element -- terms which substantially undercut the OECD consensus rate (and Eximbank's offers).[80] The Austrian offer, which at this point was only for equipment for POSCO's sinter plant, provoked a West German inquiry as to the scope of the Austrian derogation from the OECD consensus rates. Austria reportedly responded that it would offer 6.25 percent financing on any and all exports of equipment to the Gwangyang project -- a response that triggered a flurry of competing interest rate reductions by other foreign export-import banks eager to capture the POSCO contracts. West Germany's Mannesman-Demag was able to offer financing at under 7 percent for POSCO's continuous caster, and Britain's Davy McKee offered financing at 6 percent for the

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[75] Y. Lim, Government Policy and Private Enterprise: Korean Experience in Industrialization (Berkeley Korea Research Monograph, 1981), pp. 33-34.

[76] The cost estimates for the first stage of this project was about $2 billion. Projected costs for completion of the entire project were about $20 billion. Metal Bulletin, November 10, 1981, September 1982.

[77] Korea Herald, February 18, 1981.

[78] Customarily the winning bidder would form a consortium with a South Korean firm to install the new equipment.

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[79] Under the first, a direct credit option, Eximbank offered a 75 percent loan with a 15 percent down payment by the Korean purchaser -- the U.S. supplier was to finance the other 10 percent. The interest rate was fixed at 10.7 percent -- then the OECD consensus rate -- with repayment over a 20 year term beginning six months after the start-up of the project. The second option was an 85 percent Eximbank loan guarantee -- POSCO could borrow the funds anywhere it chose, in any currency, with the loan guaranteed by Eximbank. (U.S. Export-Import Bank staff). Eximbank's Chairman said that "we didn't want to subsidize any foreign expansion of steel capacity." American Metal Market, April 26, 1984.

[80] U.S. Export-Import Bank staff. The offer was publicly reported as 6.75 percent interest with deferred payment. The aid element was apparently an interest free loan or an outright grant by the Austrians to the Koreans. Austria does not have a separate export-import bank -- export financing is handled by the Ministry of Finance.

Figure 14

Export Contracts For Gwangyang Steel Project
(All Bids Selected Late 1983)

Winning Company	Country	Korean Company Forming Consortium	Component	Price Of Exported Equipment
Mitsubishi	Japan	Korea Heavy Industries	Hot Strip Mill	$171.4 million
Voest-Alpine	Austria	Hyundai Heavy Industries	Sinter Plant	$ 57 million
Voest-Alpine	Austria	Hyundai Heavy Industries	Steelmaking Plant	$ 69 million
Davy McKee	U.K.		Blast Furnace	50 million pounds
Mannesmann Demag	West Germany		Continuous Casters	$ 76.6 million
	France		Oxygen separation equipment	

Source: Metal Bulletin, December 10, 13, 23, 1983.

blast furnace.[81] The U.S. Eximbank, which disapproved of this rate reduction competition, did not undercut the OECD consensus rate or offer a subsidy -- and no U.S. equipment suppliers were awarded contracts.

The Japanese intially did not offer terms as favorable as the Europeans -- in part because they were becoming increasingly concerned about the "boomerang effect" on Japan's own steel producers of such generous aid to South Korea's growing steel industry.[82] However, Mitsubishi Corp., representing a consortium of Japanese plantmakers, ultimately submitted a bid and won a contract to install POSCO's hot strip mill by tendering an "exceptionally low" offer. A Mitsubishi spokesman said that

> there would be no profit for the [Mitsubishi] group in the deal, which had been agreed simply to keep its plants open.[83]

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[81] Metal Bulletin, January 13, 1984.

[82] Some Japanese steel producers indicated that "We are very surprised that any Japanese mills are interested in providing technical assistance for the Korean project. They will earn very little money but their final loss [from Korean competition] may be big." Metal Bulletin, August 26, 1983.

[83] Metal Bulletin, January 13, 1984. The Gwangyang episode prompted a complaint by the U.S. Department of Commerce that such project financing subsidies added to the world's excess steelmaking capacity. Lionel Olmer, Under Secretary of Commerce for International Trade, said that "in light of both the trade difficulties created by massive excess steel capacity and the U.S. position on export credits, we intend to raise the issue of the financing of the POSCO project both directly with Japan and in the OECD.... [The POSCO project] is precisely the kind of complex that should not be built until steel demand can support it." (American Metal Market, December 23, 1983; Metal Bulletin, January 10, 1984). Eximbank's Chairman indicated in April 1984 that the Bank would not make any more loans or guarantees that would have the effect of subsidizing foreign steelmaking capacity (American Metal Market, April 26, 1984).

Such intense competition by export-import banks to extend favorable financing to South Korea's state-owned steel producer should be contrasted with the problems which U.S. steel producers currently face in obtaining financing for modernization of their plants. Lacking government guarantees and having suffered a decade of low or negative earnings, the U.S. mills have sometimes experienced considerable constraints on their ability to raise debt capital. A number of these firms now carry Baa or Ba bond ratings, and the risks entailed in lending to the steel industry inevitably impose higher borrowing costs on U.S. producers.[84]

b. Development Banks

International development banks, such as the World Bank and the Inter-American Development Bank, played an important role in financing the expansion of developing country steelmaking capacity, particularly in Latin America. The World Bank, for example, had extended $1.4 billion in loans to finance iron and steel projects in the developing countries as of June 30, 1983 -- loans which were frequently cofinanced by international lenders which usually extended far larger sums than the World Bank.[85] By providing limited amounts of financing for such projects and by acting as a catalyst for lending from other sources, the international development banks have been an important stimulus for lending by the developed countries to the developing

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84/ Wall Street Journal, January 16, 1984; Business Week, June 13, 1983; Moody's 1983 Bond Ratings.

85/ World Bank Annual Report, 1983, p. 216.

Figure 15

WORLD BANK FINANCING OF BRAZILIAN STEEL EXPANSION PROJECTS

Date	Project	Source	Amount of Loan or Credit ($ Million)
1982	Carajas Iron Ore	World Bank	$305
		ECSC	600
		Japan	336
		Germany	130
		Other Commercial	227
1976	Cosipa	World Bank	$ 60
		U.S. Eximbank	
		Japan Eximbank	
		KFW	
		Morgan Guaranty	
		Bank of America	
		French Consortium	
1975	CSN	World Bank	$ 95
		Chase Manhattan	$400
		Citibank	
		Bank of America	
		First National, Boston	
		KFW	
		Banque de Paris	
		Japan Eximbank	
1972	CSN	World Bank	$ 65
1972	Usiminas	World Bank	$ 63
1971	MBR Iron Ore	World Bank	$ 65

countries.[86] These Banks have also reinforced the role of national governments in the planning and financing of their steel industries.

For example, in 1971, the Mexican government decided to undertake the construction of a modern steel plant on the Pacific coast at Las Truchas. Plans for the project were drawn up by the government, working in conjunction with the World Bank staff and the British Steel Corporation which served as technical adviser to the project. The original cost of the project, which was to be undertaken by a government-owned holding company, SICARTSA, was estimated at $679 million -- to be financed by a combination of equity contributions by the Mexican government and international loans guaranteed by the government.[87] The SICARTSA project was to be completed in several stages stretching over 15-20 years. The financing plan for SICARTSA's Stage II expansion -- begun in 1976 -- is depicted in Figure 16.

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[86] Figure 15, for example, depicts loans by the World Bank -- in some cases in conjunction with cofinancing banks -- to finance steel projects in Brazil. Since 1971 the World Bank alone has approved over $650 million in loans for Brazil's iron and steel industry. A number of these loans have been cofinanced by the Inter-American Development Bank. International Bank for Reconstruction and Development, Statement of Loans (November 30, 1983) pp. 91-100; World Bank Annual Reports, 1975 (p. 61), 1976 (p. 66).

[87] Under the original proposal $300 million in equity would be contributed by various Mexican government entities, while the World Bank and the Inter-American Development Bank contributed a total of $104 million in loans carrying a 5-year grace period. Bilateral financing agencies of nine Western countries were to provide an additional $180 million in loans, and another $75 million was to be raised from other sources.

Figure 16

PLANNED FINANCING OF SICARTSA'S STAGE II PROJECT,1976

($ Million)

	Phase A 1/	Phase B 2/	Total
Equity			
Mexican Government Capital Increase	$1,040.7	$ 77.0	$1,117.7
SICARTSA Cash Generation	851.1	159.8	344.9
Loans			
World Bank	95.0	-----	95.0
Inter American Development Bank	95.0	-----	95.0
Bilateral Export Credits	1,158.3	363.1	1,521.4
Mexican Government or NAFINSA (Government Development Bank)	409.6	37.5	447.1
Total	$2,983.7	$637.4	$3,621.1

1/ Installation of all steelmaking and hot rolling capacity and one-half of ironmaking capacity. Completion planned for in 1979.

2/ Installation of remaining ironmaking capacity, cold rolling and finishing facilities. Completion planned for 1983.

The World Bank was concerned that the latter-stage expansion of SICARTSA should be planned carefully as part of a coordinated strategy for the development of a national steel industry, and it viewed one of its principal tasks as the encouragement of the Mexican government to develop such a strategy. The Bank required Mexico to create and maintain an independent steel planning body as a condition of continued Bank assistance.[88] As work on the project progressed, the Bank continually pressured the Mexican government to take steps to ensure SICARTSA's economic viability -- various measures which the Bank wished to see adopted by Mexican government were frequently incorporated as conditions in subsequent loan agreements between the government and the Bank. The Bank was concerned that Mexican government price ceilings on steel did not enable Mexican producers to benefit sufficiently from import protection, and it obtained guarantees from the government that Mexican steel price ceilings would reflect steelmaking costs. The Bank sought and received government assurances that the government would construct housing and

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88/ In 1972, after an extensive series of discussions with the Bank staff, the Mexican government formed an Iron and Steel Coordinating Commission to formulate a long range strategic plan for the Mexican Steel Industry. (Decree Establishing Mexican Iron and Steel Coordinating Commission, May 31, 1972.) The Bank was dissatisfied with the subsequent performance of this Commission, criticizing its lack of independence, late involvement in review of expansion plans, and lack of sufficient technical staff. A Mexican government commitment to strengthen this Commission was one of the conditions of further Bank assistance to the project in 1976.

transportation facilities to support the SICARTSA plant.[89/] Moreover, the Bank sought and received a Mexican government commitment that a succession of government equity infusions into SICARTSA totaling approximately $1.1 billion would be forthcoming between 1976 and 1979.[90/]

Such relationships between international development banks and developing country governments suggest the degree to which -- at least in some major instances -- responsibility for the capacity expansion of the 1970s and 1980s has been shared by banks with developing country governments. The role of the banks in promoting steel industry expansion has in fact been so influential that developing country governments have been sensitive to charges that the banks are trespassing on their sovereignty.[91/]

[89/] The government agreed to construct a 200 km. rail link between Las Truchas and the rail junction of Nueva Italia, and committed itself to develop a city (Lazaro Cardenas) to house and provide services for the SICARTSA workers.

[90/] Mexican government authorities agreed that continuing injections of equity funding would be made according to a pre-arranged timetable in order to maintain a debt-equity ratio of 60/40.

[91/] In 1976, the World Bank charged Brazil's National Iron and Steel Company (CSN) with delaying its expansion plans. Shortly thereafter, the company's leadership was reshuffled for "administrative reasons," provoking charges that the Bank might have influenced this decision. Brazilian Senator Itamor Franco, government deputy leader, rejected this charge, stating that "The Brazilian government does not accept foreign interference in domestic affairs." (Brasilia Domestic Service, 22:00 GMT, September 3, 1976, Foreign Broadcast Information Service). See also O Estado de Sao Paulo, May 29, 1977.

c. Commercial Syndicates

A substantial proportion of the developing countries steel industry development of the 1970s and 1980s has been financed by syndicates of private commercial banks in the U.S., Western Europe, and Japan.92/ Such loans were facilitated in the 1970s by the innovation of "floating" interest rates, adjusted periodically to reflect market rates, and were frequently particularly attractive to lenders because the developing country government concerned guaranteed repayment.93/ Because the terms and amounts of many of these loans are kept secret, the full magnitude of the debt financing of developing country steel industry expansion by private Western commercial syndicates may never be known; a partial listing of commercially syndicated loans to developing country steelmakers is set forth in Appendix A.

The eagerness of commercial banks to invest in developing country industrial expansion in the 1970s is one of the underlying causes of the steel trade crisis of late 1980s.94/ In

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92/ As noted, private banks also frequently cofinance projects in conjunction with international development banks.

93/ D.P. Dod, "Bank Lending to Developing Countries," in 67 Federal Reserve Bulletin, 647 (September, 1981).

94/ Geoffrey Bell, President of Geoffrey Bell & Co., commented that "600 banks who had little or no experience in international lending joined the international syndicated credit market in the 1970s. Now, to say that their knowledge of the borrowers was modest would give them a great deal of the benefit of doubt. Most of them didn't know where the countries were within a radius of several hundred miles.... [R]egulators say 'you lent money to Venezuela, where is your country risk

FOOTNOTE CONTINUED

Brazil, for example, foreign commercial loans for investment in steelmaking ran into the billions of dollars (several such loans are summarized in Figure 17), and were advanced in a heady climate of enthusiasm for Brazilian development. On February 20, 1978 the Rio de Janeiro *O Globo* reported that

> FRANCEFI, an entity established by the [French] government to regulate the participation of French public and private banks in international lending, is currently operating with Brazil on an unlimited credit basis. [A French banker] claimed that the same procedure had been adopted by a large number of European bankers, who are even vying for participation in the pools or making isolated bids....[95]

Similarly, *O Globo* reported on April 9, 1975 that Japan's Long Term Credit Bank

> [W]ill place at the disposal of Brazilian businessmen unlimited financial resources and technical advice to draw up industrial projects in the country.... the bank is studying the granting of financing to Kawasaki to implement the Tubarao [steel] project in Espirito Santo, in association with SIDERBRÀS.

By the early 1980s such eagerness to extend easy credit had faciliated the dramatic expansion of Brazilian steelmaking capacity and the even more striking growth of Brazil's foreign debt, a combination which would create a major dilemma when a severe recession developed in 1981.

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assessment?' When you open the file you say 'There is a clipping from *The Economist*, there is something from Citibank, something from *Forbes* magazine, there's our country risk assessment." *American Metal Market*, April 11, 1984.

[95] According to one French banker, Brazil enjoyed "unlimited credits in Europe and facilities for obtaining loans for any development project." Jacques Miot in *O Globo*, February 20, 1978.

Figure 17

Commercial Syndicated Loans to the Brazilian Steel Industry

Project	Participating Institutions	Amount of Loans or Credits
Acominas Gerais SA-Acominas	Morgan Grenfell Bank of America Bank of Montreal Banque International a Luxembourg Crocker National Bank First Chicago Panama Kuwait International Investment Company Libra Bank Royal Bank of Canada Security Pacific Bank United California Bank Wells Fargo Bank Chase Manhattan	$735 million
CSN	Chase Manhattan Citibank Bank of America First National Bank of Boston KFW Japan Exim Bank Banc de Paris	$400 million
Acominas Gerais SA-Acominas	Banque de Paris et des Paysbas Banque de L'Indochine et de Suez Banque Nationale de Paris Barclays Bank International Credit Lyonnais Hong Kong and Shanghai Banking Corporation Midland Bank Morgan Grenfell & Co. National Westminster Bank Societe Generale	$200 million
Cosipa	Bank of America Morgan Guaranty Trust U.S. Exim Bank Japan Exim Bank KFW Consortium of French Banks	$200 million
Siderbras	American Express Intl. Banking Corporation Manufacturers Hanover Limited Morgan Guaranty Trust Company of New York as lead management group for a syndication	$150 million
Acominas Gerais SA-Acominas	Bayerische Landesbank Girozentrale BFG Luxembourg Commerzbank International DG Bank Compagnie Financiere de la Deutsche Bank Compaignie Luxembourg de la Dresdner Bank Deutsche Genossenschaftbank Dresdner Bank International Hypobank International Morgan Grenfell Westdeutsche Landesbank Gerozentrale	$135 million

2. Technical Aid

An important feature of the expanded steelmaking capacity installed by the developing countries in the 1970s and 1980s was the advanced nature of the facilities. The developing countries imported state-of-the-art continuous casting, direct reduction and other advanced equipment from Western nations, which provided the extensive technical aid needed to install and operate the equipment effectively. As Figure 18 indicates, much of the aid given was and is being extended by West Germany, Britain, the United States and Japan; in addition, Austria, Italy, France, Canada, and Switzerland have frequently extended such aid. The Soviet Union has provided extensive technical assistance to Eastern Europe nations as well as developing countries outside the Soviet Bloc.[96]

The Japanese, whose steel industry is highly advanced technologically, have been leaders (along with the West Germans) in exporting steelmaking equipment and know-how to the developing countries. Their motives have been mixed; they have seen such aid as a means of rendering valuable assistance to less advanced nations, as a *quid pro quo* for guaranteeing stable energy supplies, and as a means of providing work for their equipment builders during periods of slack domestic demand. Thus Japanese technical assistance efforts, which had been under way since the

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[96] The Soviet agency Techno-Export assisted Nigeria in establishing a major integrated steel industry which is just beginning to produce significant quantities of steel. Lagos *Daily Times*, July 27, 1983.

Figure 18

EXPORT OF TECHNOLOGY TO THE STEEL INDUSTRIES OF DEVELOPING COUNTRIES

1980-1983

Supplier/ Exporter	Recipient Country	Recipient Firm	Equipment and Services	Year
Kobe Steel (Japan)	Nigeria	Kastina (location of project)	Construction of re-rolling mill	1980
Mannesmann Demerg (West Germany) as Leader for a Consortium)	Nigeria	JOS (location of project)	Construction of re-rolling mill	1980
Eisenbrau as Leader of a West German Consortium	Nigeria	Oshogbo (location of project)	Construction of of steelmaking plant	1980
Pennsylvania Engineering Corp. (US)	Nigeria	Epe (location of project)	Construction of steelmaking plant	1980
Allegheny Ludlum (US)	South Korea	Pohang	Technical assistance in electronic steelmaking	1980
GHH (West Germany) and Hitachi Ship building and Engineering Co. (Japan) as Leaders for a Consortium	Mexico	Ahmsa (at Monclava)	Construction of Continuous Caster	1980
GHH (West Germany) Kawasaki Heavy Industries (Japan), and Dravo (US)	Mexico	Hylsa	Engineering and construction contract for the steelmaking plant and technical assistance	1980
Marubeni (Japan)	Mexico	Sicartsa	Concentration	1980-1981
Dravo (US)	Mexico	Sicartsa	Construction of the Peletizer Plant	1980-1981
Davy-Loewy (UK)	Mexico	Sicartsa	Plate Mill	1980-1981
GHH Aktienverein Group (West Germany)	Mexico	Sicartsa	Construction of a 2m-tpy D-R Steelmaking Plant	1981
Ishikawajima-Harima Heavy Industries (Japan	Mexico	Hylsa (Objectivo 2000 programme)	Engineering Work On Soaking Pits, Ameting Shop, and (2) Electric Furnaces	1981
Tippins Machinery Co. (US)	South Africa	Highveld Steel	Installation of hot strip mill	1982
Davy-Loewy	Brazil	Acominas	Modification billet/bloom mill and coordination of civil engineering	1982
Mannesmann Demag West Germany) as Leader of a Consortium	South Korea	Pohang	Wire Rod Mill	1982

1950s,[97] were stepped up dramatically in the late 1970s when world steel demand began to stagnate.[98] Japanese equipment and technical assistance made possible the construction of South Korea's Pohang Iron and Steel Works,[99] and Japanese engineers and equipment -- the latter usually financed by Japan's Export-Import Bank and Japanese commercial syndicates -- have figured heavily in the massive capacity expansion efforts under way in Mexico and Brazil.

Since 1981 Japanese steelmakers have become increasingly concerned about the so-called "boomerang effect" of such technical aid -- the fact that the developing country steel plants which they helped to build are now driving Japanese steel out of many world markets. As a result, some Japanese firms, such as Sumitomo and Nippon Steel, have balked at extending

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97/ In the late 1950's Japan began extending technical assistance to the Brazilian steel industry. Japan exported steelmaking production equipment to facilitate the establishment and expansion of USIMINAS, providing blast furnaces, converters, plate mills, a hot-rolled tandem mill, a cold-rolled tandem mill, a cold-rolled reverse mill, and numerous other facilities, as well as extensive technical aid and training. By 1976 USIMINAS was producing 3.6 million tons of steel per year. Tekko Nenkan observed in 1982 (p. 178) that "because of the success of the USIMINAS project, Japanese steel manfacturing techniques and the high quality of its machines are recognized widely in the world."

98/ Tekko Kaiho, October 21, 1980.

99/ In addition to providing most of the production equipment itself, Japanese firms (Nippon Steel and Nippon Kokan) provided training for employees, advise in the construction of the plan, technical planning for specifications and construction design, advice for material procurement and construction orders, and trial operation and guidance after start-up. Tekko Kaiho, August 1, 1970.

further aid to developing country such as South Korea.[100] However, the Japanese government and much of the steel industry remains, on balance, committed to continuing aid to the developing countries -- if for no other reason than that if they ceased to provide such assistance, their place would quickly be taken by other Western nations eager for the business.

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[100] Nikkei Sangyo, April 21, 1983; Japan Economic Journal, December 8, 1981.

APPENDIX A

Publicized Eurocredits and Syndicated Loans To The Steel Industries of the Developing Countries

This Appendix lists some of the publicly reported individual commercial loans by financial institutions in the developed countries extended to the steel industries of the developing countries between 1976 and 1982. Many additional loans have been made to developing country steel producers that have not been publicized and the cumulative net volume of such loans may never be known.

Publicized Eurocredits and Syndicated Loans to the Steel Industries of Developing Countries[1/]

1976-1982

Borrower	Amount	Lead Management Group	Interest Rate Margin	Term	Date[2/]
China Steel Corp.	$ 15 million	A SEAM Capital Corp. Ltd.	n.a.	n.a.	July 1976
China Steel Corp.	$ 80 million	Manufacturers Hanover Asia, Ltd.	n.a.	n.a.	Sept. 1976
Altos Hornos de Vizcaya	$ 50 million 55 million	n.a. n.a.	n.a.	n.a. 5 years	Dec. 1976 Jan. 1977
Comphania Acos Especiais Itabira	$ 80 million	n.a.	n.a.	n.a.	Feb. 1977
	$ 80 million	n.a.	n.a.	n.a.	April 1977
Korea Integrated Steel	$ 10 million	Chase Asia, Ltd.	n.a.	n.a.	Feb. 1977
Korea Integrated Steel	$ 10 million	n.a.	n.a.	n.a.	April 1977
Dalmine Siderca SAIC Argentina	$ 6.1 million	European Brazilian Bank Euro-Latinamerican Bank Midland Bank Societe Financiere Europeene Finance Co., N.V.	n.a.	4 years	May 1977

[1/] This is only a partial list.

[2/] The date refers to the *Euromoney* issue in which this information was published. The credit or loan transaction occurred in one of the two preceding months.

Publicized Eurocredits and Syndicated Loans (Con't)

Borrower	Amount	Lead Management Group	Interest Rate Margin		Term	Date
Empresa Nacional Siderurgica, SA	$ 55 million	Banque Europeenne de Credit Samuel Montague & Co. Banco Arabe Espanol, SA International Commercial Bank Compagnie Financiere de la Deutsche Bank AG	1.625		5 years	May 1977
Empresa Nacional Siderurgica	$ 55 million	London Multinational Bank Banque Urguijo Hispano Americano Berliner Bank International Credit Suisse Europartners Bank (Nederland) Interunion-Banque Kleinwort, Benson Lloyds Bank International P K Banken International (Luxembourg) The Nippon Fuddosan Bank Western American Bank Europe	1.625		6 years	Nov. 1977
China Steel Corp.	$ 50 million	Crocker National Bank Rainier National Bank Security Pacific Bank United California Bank	1.25		7 years	Feb. 1978
Dalmine SpA	$ 26 million	Credito Italiano Credito Italiano (London) Hombros Bank Marine Midland Bank Standard Chartered Bank	1 1/2 1 5/8	3 2	5 years	April 1978
Pohang Iron & Steel Company	$100 million	Citicorp International Group	1 3/8		7 years	May 1978
CVRD	$100 million	Bank America International Group	n.a.		10 years	July 1978

Publicized Eurocredits and Syndicated Loans (Con't)

Borrower	Amount	Lead Management Group	Interest Rate Margin	Term	Date
Acesita Steel Co.	$ 65 million $ 55 million	Bankers Trust International Chemical Bank International European Brazilian Bank Ltd. Manufacturers Hanover Ltd. National Bank of North America Standard Chartered Merchant Bank	7/8 1 3/8	5 years 10 years	Sept. 1978
Compania Siderurgica de Tubarao CST	$350 million $250 million $150 million	The Long-Term Credit Bank of Japan The Bank of Tokyo	1 1/4 1 3/8 1 3/8	2 years	Jan. 1979
Pohang Steel Company	Y9.800 million	The Nippon Credit Bank Ltd.	7.4% Fixed Rate	7 1/2 years	April 1979
CVRD	$200 million	Chase Merchant Banking Group	1.0	10 years	May 1979
Siderbras	$100 million	Dai-Ichi Kangyo Bank Taiyo Kobe Bank	1 1/8	12 years	May 1979
CVRD	$ 30 million $ 30 million	Bank of Montreal	7/8 n.a.	10 years 10 years	Aug. 1979 Sep. 1979
Compania Cia de Acero del Pacifico (CAP)	$170 million		7/8	10 years	Feb. 1980
CSN	$ 75 million	Bank of Tokyo	1 1/8	12 years	Oct. 1979
China Steel Corp.	$ 30 million $ 50 million	Bank of America First National Bank of Boston Republic National Bank of Houston	1/2 1/2	6 1/2 years 8 1/2 years	Oct. 1979
Siderbras	$ 25 million $ 53 million	Mitsubishi Bank	n.a.	12 years 13 years	Dec. 1979

Publicized Eurocredits and Syndicated Loans (Con't)

Borrower	Amount	Lead Management Group	Interest Rate Margin		Term	Date
CVRD	$ 30 million	Manufacturers Hanover Ltd.	3/4		12 years	Feb. 1980
Altos Hernos de Mexico	$ 45 million	Royal Bank of Canada (London)	3/4	5	10 years	Aug. 1980
			7/8	5		
CVRD	$ 50 million	Wells Fargo	n.a.		2 years	Aug. 1980
Hylsa SA	$145 million	Chase Manhattan, Ltd.	1 1/8	4		
		Bank of Montreal	1 1/4	4	12 years	Aug. 1980
		Continental Illinois	1 3/8	4		
		Republic National Bank of Dallas				
		Banque de Paris et des Pays - Bas Belgique				
		International Westminster Bank				
		First City National Bank of Houston				
Siderurgica del Ornico Corporacion Venezolano do Guayana	$105 million	Bank of Montreal	1/2	4	8 years	Aug. 1980
	$105 million	Bankers Trust International	5/8	4		
		Group	3/4	4	8 years	
		Citicorp International Group	5/8	4		
		Commerzbank				
		Lloyds Bank International				
Acominas	$ 45 million	Morgan Genfell	1 3/8		8 years	Nov. 1980
Fundidora de Monterrey SA	$300 million	Bank America International Group	1/2	4	8 years	Nov. 1980
		Royal Bank of Canada (London)	5/8	4		
		Morgan Guaranty Trust Co. of New York				
		Bank of Tokyo				
		Bank of Montreal				
		Lloyds Bank International				
		Banco di Roma				
		Banco Nacional de Mexico				
		Grindlay Brandts				

Publicized Eurocredits and Syndicated Loans (Con't)

Borrower	Amount	Lead Management Group	Interest Rate Margin		Term	Date
AHMSA	$ 21 million	Creditanstalt Bankverein	n.a.		n.a.	June 1981
	$ 20 million		1/2 5/8 3/4 7/8	2 3 3 2	10 years	
CVRD	$300 million	Chase Merchant Banking Group Arab Banking Corp. Morgan Guaranty Bank of Tokyo Bankers Trust International Citicorp International Group Compagnie Luxembourgeoise de la Dresdner Bank Industrial Bank of Japan National Bank of Canada Royal Bank of Canada (London)	2 (above U.S. prime)		8 years	June 1981
Las Truchas	$500 million	Lloyds Bank International[3]	n.a.		n.a.	n.a.

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[3] Journal of Commerce, October 6, 1982

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-207021

AUGUST 3, 1983

The Honorable John Heinz
The Honorable Arlen Specter
United States Senate

Subject: Effect of Foreign Steel Purchases by Domestic Steel Producers (GAO/NSIAD-83-40)

In your letter to the Comptroller General dated March 7, 1983, you asked us to examine the effects of foreign steel purchases by domestic steel producers on steel industry employment. To make this examination, we asked 10 major steel-producing firms to provide us with information about their steel imports during 1980-82, plus any actual or planned purchases in 1983. We obtained data to supplement this information from the International Trade Commission, the Customs Service, and the American Iron and Steel Institute's annual statistical report. In order to answer your request in a timely manner, we could not survey all steel companies; therefore our estimates do not include steel imports by all steel companies. We believe, however, that our estimates approximate the magnitude and impact of such imports.

The amount of estimated steel imports by steel companies was small, especially when expressed as a percent of total imports and domestic production. Although estimated imports by steel producers increased by 300 percent from 1980 to 1982, or from about 209,000 tons to 835,000 tons, these imports comprised only 1.4 percent of total steel imports in 1980 and 5.0 percent in 1982. Furthermore, these estimated imports were 0.2 percent and 1.1 percent of domestic raw steel production, respectively, in these years.

The most significant factor in the increase in steel imports from 1980 to 1982 by steel producers was Kaiser Steel's imports of semifinished steel. These accounted for 48.6 percent of our estimated 1982 imports. Kaiser used these imports to sustain its steel finishing operations after it greatly curtailed steelmaking at its Fontana, California, plant.

(483388)

Because estimated steel company imports were relatively small during 1980-82 in relation to domestic steel production, we believe that they had little if any impact on average employment in the steel industry, which declined by 27.4 percent during that period. Other factors, such as the depressed condition of the steel industry had a much more important impact on employment trends in the steel industry.

To accomplish the objectives of our review, we used information reported to us from U.S. Steel, Bethlehem, LTV (Jones and Laughlin), National, Inland, Armco, Republic, Wheeling-Pittsburgh, Kaiser, and Cyclops steel companies. These companies accounted for 75 percent of raw steel production in 1981. All of them voluntarily cooperated with our request for information on the amounts and reasons for their foreign steel purchases. Eight of the companies contacted reported importing some steel. We supplemented and attempted to verify the information received from the steel companies with information on finished steel imports they provided to the International Trade Commission as part of its 1982 injury investigation under the countervailing duty statute. We also attempted to verify our information on semifinished steel imports with import data from the Customs Service. We were unable to do so, however, because steel companies were generally not listed by the Customs Service as the ultimate consignees or importers of record. Therefore, to estimate industry imports, we assumed that all imports of semifinished steel were ultimately purchased by steel companies because they have the necessary finishing facilities to turn semifinished steel into finished products. Our semifinished steel import data was obtained from the American Iron and Steel Institute's annual statistical reports, which are based on Census Bureau data.

Additional information on steel companies' estimated steel imports is in the enclosure. However, the specific numbers are subject to the qualifications enumerated in that enclosure.

As arranged with your office, we plan no further distribution of this report until 5 days from the date it is issued. At that time, we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,

Frank C Conahan

Frank C. Conahan
Director

Enclosure

FOREIGN STEEL PURCHASES BY DOMESTIC STEEL COMPANIES HAD LITTLE IF ANY EFFECT ON EMPLOYMENT TRENDS

BACKGROUND

In January 1982, seven U.S. steelmakers filed 94 countervailing duty petitions that alleged material injury by reason of subsidized imports of steel from eight European countries, Brazil and South Africa. The U.S. Government agreed with many of the petitioners' allegations, but before countervailing duties were to be imposed, the United States and the European Community (EC) concluded an import restraint agreement in October 1982 with the concurrence of all major producers in the U.S. steel industry. Under the agreement the EC will limit finished steel shipments to the United States from November 1, 1982, to December 31, 1985, to an average 5.46 percent of the U.S. market for 10 categories of steel. The Secretary of Commerce stated that the restraint agreement "removes one of the most severe trade frictions between the United States and the European Community * * *."

On March 7, 1983, Senators Heinz and Specter wrote to the Comptroller General requesting GAO to investigate the effects of purchases of foreign steel by the domestic steel industry on employment in that industry. The Senators stated that their constituents were speaking out about the irony of an industry which fought an aggressive battle against imports (using, for example, the countervailing duty statute) now turning to foreign products for its own purchases.

The objective of this report was to assess the magnitude of foreign steel purchases by domestic steel companies and to place such purchases within the context of employment trends in the domestic steel industry.

We found that domestic steel companies did indeed import foreign steel during the period covered by our assessment. We believe, however, that the relatively small amounts of such purchases had little, if any, effect on employment trends in the steel industry.

SCOPE AND METHODOLOGY

We believe the import data in this report captures the bulk of steel imports by domestic steel companies. We included all semifinished steel imports into the United States, as well as finished steel imports reported to us by 10 steel companies which represented 75 percent of domestic raw steel production in 1981. We supplemented information regarding finished steel with company-specific data gathered by the International Trade Commission

(ITC) as part of its injury determination in 1982 under the countervailing duty statute. However, there are several qualifications to our data on finished steel imports.

1. Neither the ITC's data nor ours covered all domestic steel producers. We requested information from 10 steel companies, including the 8 largest firms, and 8 of these 10 companies reported some purchases of foreign steel. The ITC requested information from 32 companies, including the 7 largest firms, and 9 of these 32 companies reported some purchases of foreign steel.

2. We were not able to verify or adjust data on imports by U.S. steel producers because the information provided by the Customs Service lists only the importers of record or ultimate consignees, which may not be the ultimate end users. Furthermore, the ITC's data covered only finished steel products which were part of its injury investigation in 1982. Some respondents to the ITC's and our surveys included steel imports by their subsidiaries and/or service centers. Other companies did not include this information. For example, one company maintains over 30 service centers but reported imports to us for only one in 1981. Another company's subsidiaries imported 39,975 tons of finished steel in 1980 and 1981, or 25.6 percent of our total estimated finished steel imports by steel companies for those years.

3. Our data covered a different timeframe than the data provided to the ITC. We asked for import data for 1980 to 1982 as well as any planned or actual imports for 1983. The ITC's data generally covered finished steel imports by steel companies for 1978-81, although some companies included preliminary 1982 data.

4. Two companies provided the value rather than quantity of steel imports to the ITC. The amount totaled $16.2 million for 1980-82. We did not include this information in our estimates of steel company imports.

5. The ITC's data on finished steel imports by steel companies was not verified for accuracy by ITC's staff. They did not include this data in their report on the results of their injury determinations under the countervailing duty statute.

EMPLOYMENT IN IRON AND STEEL INDUSTRY DECLINED DURING 1980-82

During 1980-82, the number of employees in the iron and steel industry decreased by about 110,000, or 27 percent. The decrease in employment was greater for wage earners than for salaried employees, as shown in table 1.

Table 1

Average Number of Employees Working in the Steel and Iron Industries

Average number of employees	1980	1981	1982	Percent of changes
Receiving wages	291,483	286,219	198,477	-31.9
Receiving salaries	107,346	104,695	90,960	-15.3
Total	398,829	390,914	289,437	-27.4

Source: American Iron and Steel Institute.

The number of steel and iron industry employees laid off increased substantially between 1981 and 1982. The American Iron and Steel Institute reported that as of December 31, 1981, 76,367 employees had been laid off and 16,388 were working less than full time; at the end of 1982, 166,653 employees had been laid off and 14,000 others were working less than full time. The Institute reported in 1983 that approximately 500,000 employees in supporting industries had lost their jobs as of December 31, 1982, because of the depressed condition of the steel industry in 1982. In that year, domestic raw steel production declined by about 46 million tons from 1981, or 39 percent. Imports of steel mill products also declined in 1982 by 3.2 million tons, or about 16 percent.

The depressed condition of the steel industry was marked by a number of plant closings. As an indication of the impact on employment of such closings, we obtained information from Kaiser Steel concerning its decision during 1981 and 1982 to close its steelmaking facility at Fontana, California. Kaiser Steel reduced its workforce from 9,632 employees at the end of 1981 to 5,000 in 1983.

In 1981, Kaiser began a program of importing relatively small amounts of semifinished steel for finishing at Fontana, and in 1982 it accelerated these imports. Employment at Fontana became concentrated in steel finishing rather than in steel making. A representative of Kaiser told us that Kaiser will close its finishing facilities by December 1983. Kaiser expects that discontinuation of steelmaking and finishing operations will cause a substantial reduction in that workforce of 2,500.

STEEL COMPANIES IMPORT RELATIVELY SMALL AMOUNTS OF STEEL

Steel imports by steel companies are a small percent of total domestic imports and production. As shown in table 2, imports by steel companies increased during 1980-82; however, our estimate of these imports comprised no more than 5 percent of annual imports during this period and averaged approximately 3.6 percent of total imports. Steel imports by steel companies averaged 0.7 percent of total domestic raw steel production from 1980 to 1982.

Table 2

Estimated Imports by Selected Steel Companies as a Percent of Total Steel Imports and Raw Steel Production

	1980 (tons)	1981 (tons)	1982 (tons)
GAO's estimate of imports by steel companies (note a)	209,283	891,386	834,885
Total imports of steel mill products (note b)	15,494,970	19,898,340	16,662,532
	(percent)	(percent)	(percent)
Selected steel companies' imports as percent of total imports	1.4	4.5	5.0
Selected steel companies' imports as percent of domestic raw steel production	0.2	0.7	1.1

[a] Data based on American Iron and Steel Institute statistics for semifinished steel imports and finished steel totals reported to GAO and ITC by individual steel companies.

[b] According to the American Iron and Steel Institute.

Most steel imports by steel companies consisted of semifinished steel. Semifinished steel is defined as steel used primarily as a raw material for other steel products and generally consists of ingots, blooms, billets, and slabs. We assumed that semifinished steel is ultimately imported only by steel companies who can convert it into finished products by further processing. Therefore, we attributed the Institute's totals for semifinished steel to U.S. steel companies.

In 1981 and 1982, semifinished steel imports were significantly higher than 1980 imports, but still represented a relatively small percent of total steel imports. (See table 3.) In 1980 and 1981, one company accounted for 15.2 and 19.5 percent, respectively, of total semifinished steel imports. A further 22.3 percent was imported by another major steel company in 1981. In 1982, Kaiser Steel accounted for 56.7 percent of total semifinished steel imports.

About 52 percent of U.S. semifinished steel imports in 1980-82 came from Canada. Some of this semifinished steel was exported from Canada to the United States for "conversion and return." Partially as a result of a strike in 1981 at Canada's largest steelmaker (Stelco), semifinished steel exports to the United States increased from 102,640 tons in 1980 to 579,267 tons in 1981. In 1982, Canada's exports of semifinished steel to the United States fell to 185,922 tons. During 1980 through 1982, 292,526 tons were exported for conversion and return, mostly in 1981, according to a Stelco official.

Table 3

Semifinished Steel Imports

	1980	1981	1982
Total imports of semifinished steel in tons (note a)	155,343	790,062	716,588
Semifinished steel imports as percent of total steel imports (note b)	1.0	4.0	4.3

[a] According to American Iron and Steel Institute.
[b] See table 2 for figures on total steel imports.

Semifinished steel imports for the first quarter of 1983 were 254,318 tons.

Finished steel consists of products which are ready to be sold or consumed in current form, and may only require slight modifications for final use. According to our estimates, steel companies accounted for less than 1 percent of total finished steel imports in 1980-82, as shown in table 4.

Table 4

Finished Steel Imports

	1980 (tons)	1981 (tons)	1982 (tons)
Total imports of finished steel	15,339,627	19,108,278	15,945,944
Finished steel imports by steel companies (note a)	53,940	101,324	118,297
	(percent)	(percent)	(percent)
Finished steel imports by steel companies as percent of total finished steel imports	0.3	0.5	0.7

[a] Figures based on finished steel imports reported to GAO and ITC. We adjusted the figures to eliminate duplicate reporting.

Imports by a few companies account for most of the finished steel imports by steel companies. For example, in 1981, one major steel producer imported approximately 55,000 tons of various finished steel products, comprising over 50 percent of our estimates. In 1982, the same company imported about 112,000 tons of finished steel products, accounting for 95 percent of our estimate of finished steel imports.

Some of the 10 steel companies we surveyed gave us such reasons for their steel imports as (1) testing foreign steel companies' products, (2) meeting increased demand for various steel products when domestic steelmaking capacity was fully utilized, (3) meeting increased demand which could not be met due to closed steelmaking facilities or because a particular product was not manufactured by the importing company.

OUR OBSERVATIONS

We believe that steel imports by steel companies had little, if any, impact on employment trends in the steel industry. Such imports are small compared with total steel imports and domestic raw steel production.

Two events accounted for relatively large shares of steel imports by steel companies in 1981 and 1982. Kaiser Steel's imports of semifinished steel for its Fontana facility accounted for 48.6 percent of total steel company imports in 1982. The strike at Stelco increased semifinished steel imports in 1981 when semifinished steel imports from Canada increased by 464 percent. According to an official at Stelco, Canadian firms are continuing to use U.S. plants to finish steel. This steel is then re-exported back to Canada. However, such transactions accounted for a relatively small share of Canadian semifinished steel exports to the United States, except in 1981.

Mr. TRAFICANT. OK, thank you, Mr. Chairman. I think you touched a little bit upon joint venture in the development of new technologies and new methods of producing steel to make us competitive. I would like to move toward another area, and that is in regard to steel firms that move away from the steel business and diversify their holdings by acquiring an acquisition of other types of industrial pursuits. Specifically now, if you can respond, I ask directly, there was a great deal of controversy that surrounded United States Steel's 1982 purchase of Marathon Oil. Are you familiar with that?

Dr. CANTOR. Yes, sir.

Mr. TRAFICANT. How would you characterize the present financial position of those steel companies that have diversified when compared to those still remaining that have not and their prognosis for future healthy operations?

Dr. CANTOR. I would say that those companies that have nonsteel operations, nonsteel business segments, are probably in a better position to finance steel activities as well as other nonsteel. They all have assets that they conceivably could leverage to obtain capital at lower interest rates and so forth. I realize there are some of the steel companies, United States Steel Corp. in particular, that claims vigorously that it segregates its business segments—so that you cannot use the assets of one division for another.

On the other hand, I have seen reports just a few weeks ago in Business Week regarding Bethlehem Steel's acquisition of a steel service center in the south, Georgia or Alabama, I'm not sure which; where the Business Week article indicated that this could be used as a form of leverage to acquire capital for steel.

Many of the steel companies in the days when they made profits, not necessarily a lot of profit, and I'm not going back too far, I'm going back to the late 1970's; many of these steel companies invested far more in steel than the rate of return on steel would warrant, vis-a-vis, other business segments. So I would say that the diversified companies do have that possibility that the nondiversified companies do not have.

Mr. TRAFICANT. I think along those particular lines, the American tax policy that exists today hopefully is one for an incentive that would create within the code an opportunity for industry such as the steel industry to utilize every variable at their disposal to turn their particular picture around. When we talk about some of these diversification projects, do you have any evidence or have you conducted any studies or do you have any materials, to your knowledge, or any knowledge whatsoever, relative to them using the tax code to write off, to hide within the tax code some losses that they can move and perhaps expand in other areas or try and gain advantage through the tax code and through those losses?

Any knowledge of that?

Dr. CANTOR. I do not, sir. I do not have any knowledge of that.

Mr. TRAFICANT. Do you perceive that as a possibility in some of the recent developments? I mean we are talking about a steel industry that is dying, right? We are talking about a steel industry that is on the ropes but nevertheless we are seeing mergers; we are seeing a large movement toward it; we are seeing a concentrated period of time when industry has used the conditions that exist to reduce labor costs, concessions, pressure. But if things are so bad, why are all these big companies ultimately starting to merger and looking toward joint acquisitions and taking a firmer hold of an industry base that supposedly is not only limited but in trouble? Something does not add up is what I am saying. Could you respond to that?

Dr. **Cantor**. In some instances I would suspect, and clearly one of the companies that is prominent in this as one that merged or achieved the merger of two steel companies 1 year ago is present in the room and could talk perhaps more to this; I would expect that some of these mergers are to acquire, one, certain types of plants that are configured to produce certain products; I would expect that sometimes we're talking about certain plants that do have in fact more modern capacity than some of their own or the acquirer would have. Perhaps natural resource holdings; coal, iron ore, whatever. These would be some of the reasons for those mergers. In terms of acquiring companies outside of the industry, I think I have addressed that. It provides them with a stronger financial base.

One thing I have not stated and perhaps would state as a question or as a thought, not necessarily as a thesis, as something that is; it may very well be that some companies do not want to produce steel. I do not know that for a fact. None of the steel companies have ever said that to me, nor would they of course.

Mr. **Traficant**. Doctor, to your knowledge, how much of the imported steel is being ordered by the American steel producers themselves?

Dr. **Cantor**. The only steel that I am aware of that comes in from abroad and that is purchased by American steel companies is semifinished steel, largely from Canada. Under the President's program some of the agreements that have been negotiated with foreign countries, Brazil got a large allotment of semifinished steel, which will become the feedstock at the former Kaiser plants in Fontana, CA, now the California Steel Co. Seven hundred thousand tons of Brazilian steel will be coming in for that plant. Most of the steel companies' purchases of steel is in the semifinished area and much of it comes in from Canada and, now as I have indicated, is likely to come in from Brazil.

Mr. **Traficant**. Just a few more questions briefly, Mr. Chairman, even though these questions are not probably most appropriate for you. I would like to have your position in the testimony here.

To your knowledge, how much investment has there been by the United States steel producers in the development of foreign plants where they produce a product overseas and ship it back for consumption here in the States? Do you have any knowledge of any studies relative to that or any data on record by the Research Service relative to this?

Dr. **Cantor**. Again, I will determine whether or not there are studies to this. I believe that at least one of the major American steel companies has interests in Belgium. But I would want to confirm that, too.

[The material referred to follows:]

Congressional Research Service
The Library of Congress

Washington, D.C. 20540

July 25, 1985

TO : House Committee on Science and Technology
Subcommittee on Investigations and Oversight
Attention: James Paul

FROM : David J. Cantor
Specialist In Industry Economics
Economics Division

SUBJECT : U.S. Ownership of Foreign Steel Companies --
Submission For Hearing Record

At the Subcommittee hearing, "New Technology and the Future of Steel", held on July 22, 1985 in Youngstown, Ohio, I was asked to submit for the hearing record any studies relating to U.S. ownership interests in foreign steel companies. To date, I have not been able to identify studies undertaken by others that supply this information.

In lieu thereof, I undertook a search of a directory of steel plants throughout the world to determine the extent of U.S. ownership of foreign steel companies. The search of this directory, Iron and Steel Works of the World: 1983 8th Edition, yielded 20 entries. I attached copies of the relevant entries.

In conducting this search, I selected only those entities where U.S. ownership interests were made explicit. There may well be other foreign companies in which U.S. citizens and companies may have an ownership interest. In addition, I may have inadvertently missed some entries among the 1,930 companies listed.

The companies identified are located in ten countries. They are: Argentina, Belgium, Brazil, Canada, France, Italy, Mexico, Philippines, Spain, and the United Kingdom.

United States steel companies are identified as having an ownership interest in 18 of the 20 foreign companies. Standard Oil of Ohio is listed as the owner of the Canadian firm, QIT-Fer et Titane, Inc. Unspecified American interests are identified as holders of a 29-percent interest in the Philippine company, Republic Steel Tube Inc.

Caution should be exercised in using this information. We cannot determine that any U.S. imports of steel mill products from the ten countries were shipped by any of the companies identified. All we can say is that this is a possibility.

I trust that this information is responsive to the request of the Subcommittee. We are assembling other materials on this subject generally and will forward them to you shortly. In the meantime, if you have other questions please call me at 287-7740.

IRON AND STEEL WORKS OF THE WORLD

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Siderúrgica Nossa Senhora Aparecida SA (continued)

free-cutting steels; spring steels (wire) (1,796 tons), bearing steels (wire) (1,200 tons), bright wire, black annealed wire, stainless steel wire and alloy steel wire; bright bars – rounds 2 to 76·20mm (or equivalent area) (15,600 tons); centreless ground – rounds 2 to 76·20mm (4,200 tons); peeled bars – rounds 12 to 76·20mm (4,200 tons); carbon steels, low-alloy steels, stainless steel, tool steels; welding wire (1,918 tons), wire for general applications (2,423 tons), needle wire (78 tons), wire products (2,436 tons), stainless steel wire (54 tons).
Brands: Supercort (highly machinable/free-cutting (leaded) steel); Soldac (welding wire); Aços Ipanema (tool steels and forgings); Arames Cleide (wire products).
Sales offices/agents: Av. Fagundes de Oliveira 510, 09900 Diadema, SP (Tel: 011 445 24 11. Telex: 011 4441 imsp br).

Armco do Brasil SA Indústria e Comércio

Head office: Rua Dr. Francisco Mesquita 1575, São Paulo, SP. **Telex:** 1123277 armc br.
Established: 1911.
Works: São Paulo. Rolling mills: Sendzimir reversing, Schloemann MKW, seven single-pass 2-high cold mills, 4-high Sundwig mill, ten single-pass 2-high cold mills. Strip coating lines: Universal electrolytic line for zinc, terne, brass, copper and nickel coated strip (annual capacity about 2,000 tons).
Products: Cold rolled hoop and strip up to 500mm wide; coated strip; high-carbon and alloy strip up to 450mm wide; hardened and tempered strip.

Cia Metalúrgica Barbará

Head office: Av. Almirante Barroso 72, 12° andar, Rio de Janeiro. **Tel:** 240 7007. **Telex:** 021 21478. **Cables:** Barbarah.
Management: Directors: Jean Michel Caffé (general manager), Pierre Bernard René Rangé, João Sérgio Marinho Nunes, Guy Rolli, Jean-Jacques Faust. Council: Jean Paul René Ricommard (president), Almirante Aniceto Cruz Santos, Baldomero Barbará Neto, Fernando Rudge Leite, João Sérgio Marinho Nunes, François Nieto, Jean-Jacques Faust. Technical manager: Jean Paul Kohler. Sales manager: Pierre Bernard René Rangé. **Established:** 1937. **Capital:** Cr$6,300 million. **Subsidiaries:** Samarco.
Works: Via Dr. Sérgio Braga 452, Barra Mansa, RJ. Tel: 22 1022. Ironmaking plant: Two blast furnaces and one electric furnace (nominal annual capacity 150,000 tons); centrifugal cast iron pipe plant, foundry. Other plant: Avenida dos Jamaris 208, São Paulo, SP. Manufacturing of valves and water and sewage treatment equipment.
Products: Ductile (SG) iron pipes 2 to 48" dia for water and sewage; fittings and other castings; industrial valves; water and sewage treatment equipment.
Brands: Barbará, Cornersol.
Sales offices/agents: Al. dos Jurupis 896, São Paulo, SP. Offices in Recife, Salvador, Belo Horizonte, Brasília, Campinas, Ribeirão Preto, Curitiba and Porto Alegre.

Siderúrgica Barra Mansa SA

Head office: Av. José Cesar de Oliveira 21, 05317 São Paulo, SP. **Tel:** 831 3311. **Telex:** 011 31641 usbm br.
Established: 1937. **Ownership:** Votorantim group.
Works: Sinter plant: Semi-continuous (annual capacity 100,000 tons). Ironmaking plant: Two charcoal blast furnaces – No. 1 (61,000 tons), No. 2 (39,000 tons). Steelmaking plant: Two 15-ton LD converters (120,000 tons), three 25-ton open hearth furnaces (116,000 tons). Continuous casting machines: One 2-strand Demag for billets 80mm sq, 130mm sq (90,000 tons), one 4-strand Demag for billets 120mm sq, 130mm sq (150,000 tons). Rolling mills: Include blooming, medium section and Demag merchant. Other plant: Wire plant.
Products: Carbon steel wire rods, reinforcing bars, round bars, square bars, light angles, black annealed wire. Rolled steel output in 1981, 171,771 tons.
Expansion programme: Two 50-ton electric arc furnaces were ordered from Demag in 1980.

Acindar SA – Acindar Industria Argentina de Aceros SA (continued)

one 50-ton (annual capacity 260,000 tons). Rolling mills: Birdsboro bar mill (100,000 tons), Schloemann/Birdsboro wire rod and bar mill (130,000 tons), Santa Rosa/Birdsboro blooming mill (240,000 tons). Other plant: Sixty-one drawing machines (60,000 tons); forging presses – Birdsboro and Davy (20,000 tons).
■ Av. Fco. Pienovi, Avellaneda. Steelmaking plant: Two 65-ton Lectromelt electric arc furnaces (annual capacity 240,000 tons). Continuous casting machines: Two 4-strand Demag for billets (480,000 tons). Rolling mills: Schloemann/Ashlow (285,000 tons).
Products: Direct reduced iron, carbon steel ingots, alloy steel ingots, stainless steel ingots, carbon steel slabs, carbon steel billets, alloy steel billets, stainless steel billets, carbon steel wire rods, high-carbon steel wire rods, alloy steel wire rods, stainless steel wire rods, reinforcing bars, round bars, square bars, flats, bright bars, stainless steel bars, alloy steel bars, light angles, light tees, light rails, cold rolled hoop and strip, galvanized hoop and strip, longitudinal-weld tube and pipe, galvanized tube and pipe, hollow bar, high-speed steels, free-cutting steels, spring steels, bearing steels, bright wire, black annealed wire, galvanized wire, barbed wire, stainless steel wire, alloy steel wire.
Sales offices/agents: At head office address; also at Balcarce 358, 1064 Buenos Aires (Tel: 33 4091-99; 33 4071-79).
Expansion programme: One direct reduction module – capacity about 600,000 tons/year (1986); one continuous casting machine – capacity about 450,000 tons/year (1986); one oxygen plant.

Armco Argentina SA

Head office: Av. Corrientes 330, 1378 Buenos Aires. **Tel:** 311 6215; 311 4947. **Telex:** 2 2195. **Cables:** Armco.
Management: Luis U. Jáuregui (country manager), Héctor C. Posse (vice president), Luis A. Cerisoli (product manager, metallurgical products), Carlos J. Priante (product manager, construction products), Guillermo Souza Brito (production manager).
Capital: Pesos 66 million. **No. of employees:** 225 (works); 163 (office).
Ownership: Subsidiary of Armco Inc, Middletown, OH, USA (99%).
Works: Valentín Gómez 210, Haedo, BA. Tel: 629 0071-5; 629 0151-2. Telex: 2 2195. Production manager: Guillermo Souza Brito. Tube and pipe mills: One Yoder M-2½ for mechanical tubing ¾ to 3", 0·9 to 2·5mm thick (annual capacity 8,000 tons). Coating lines: Armco Sendzimir coating line No. 2 (galvanizing and aluminizing), gauge 28 to 12, max width 4' (45,000 tons); Armco Sendzimir line No. 1 (galvanizing and long-terne), gauge 28 to 14, max width 4' (9,000 tons).
Products: Galvanized coil/sheets, aluminized coil/sheets and long-terne sheets; longitudinal-weld tube and pipe (mechanical) and galvanized tube and pipe.

La Cantábrica SA Metalúrgica, Industrial y Comercial

Head office: Moreno 755, 1092 Buenos Aires. **Tel:** 33 8351. **Cables:** Lacantábrica.
Management: Jaime Bernardo Coll (president), Ernesto F. Pittaluga (works manager), Alberto Moure (administrative manager), Osvaldo Alonso (financial manager), Oscar N. Bronzina (sales manager), Enrique J. Coll (general manager). **Established:** 1902.
Capital: Pesos 71 million. **No. of employees:** 462 (works); 248 (office).
Annual capacity: Rolled steel 160,000 tons.
Works: Tres Arroyos 329, Haedo 1706, Buenos Aires. Tel: 629 1515. Works manager: Ernesto F. Pittaluga. Rolling mills: 2-stand 3-high 20/20", 1-stand 2-high 20" (annual capacity 40,000 tons); 13-stand 500/250mm 'baby' blooming (120,000 tons). Other plant: Forge with six forging presses, two forging rolls and four hammers. Foundry with two cupolas (1,000 tons/month), one induction furnace (500 tons/month) and one electric arc furnace.
Products: Hot rolled products – round bars ½ to 3½"; square bars ½ to 3½"; flats 1 x ⅛" to 6 x 1"; light angles ¾ x ⅛ to 4 x ⅜; special sections; light rails (elevator); joists (IPN 80 to 160, UPN 80 to 160); grey iron and nodular castings, steel castings; forgings

ALZ NV (continued)

rolled stainless steel coil/sheets, stainless steel hot rolled band for rerolling, stainless steel plates, cold rolled stainless steel hoop and strip; cold rolled sheet and strip 0·4 to 6mm thick, 9 to 1,350mm wide.
Sales offices/agents: Sales offices: Avenue Cortenberg 79-81, B 1040 Brussels (Tel: 02 733 9893. Telex: 21979 alzbru). ALZ France Sarl, 9 Rue Chévert, F 75008 Paris (Tel: 705 88 70. Telex: 250778 alzfra). ALZ NV Sucursal en España, Mutaner 270, 5°A, Barcelona 21 (Tel: 228 1308. Telex: 53024 alesa). ALZ Edelstahl GmbH, 60 Kettwiger Strasse, D 4300 Essen 1 (Tel: 201 2359551. Telex: 8579895 alzd); Theodor Heuss Platz 1, Postfach 1105, D 7012 Fellbach b. Stgt (Tel: 711 587818. Telex: 7254818). ALZ Nederland BV, Burg. C. F. Smetetslaan 8, 1901 GA Castricum (Tel: 12518 56752. Telex: 35338 alz nl). ALZ Stainless (UK) Ltd, 32 Cumberland Street, Sheffield S1 4PT (Tel: 0742 77004. Telex: 54325 alzuk). ALZ Svenska AB, 13 Björkhultsvägen, S 63229 Eskilstuna (Tel: 016 424870. Telex: 46022 alz s).

Antwerpse Walserijen NV (Laminoirs d'Anvers SA)

Head office: Metropolestraat 38, B 2120 Schoten. **Tel:** 03 645 68 64. **Telex:** 31700.
Products: Merchant bars including equal and unequal light angles, light tees, light channels, flats, half-rounds; special sections.

Armco SA

Head office: Au Wérihet 55, B 4520 Wandre-Liège. **Tel:** 041 62 79 83; 041 62 79 96; 041 62 98 50. **Telex:** 41575 armclg b. **Cables:** Arstrip Liege.
Management: Roger Van Brusselt (general manager), Pierre Lemlyn (materials manager), Paul Delobbe (technical administration manager), Jacques Wuinant (metallurgy, and research and development manager), Jean-Marie Colle (production manager), Marcel Verhaegen (treasurer), Mathieu Darchis (industrial engineering manager). **Established:** 1964. **Capital:** BFr 210·95 million. **No. of employees:** 190 (works); 70 (office). **Ownership:** Subsidiary of Armco Inc, Middletown, OH, USA.
Works: Wandre-Liège (head office). Works director: R. Van Brusselt. Rolling mills: Schloemann MKW 63" cold strip mill (annual capacity 36,000 tons), Schloemann ZKW 40" temper mill (10,000 tons). Strip coating lines: Copper plating line (30,000 tons).
Products: Cold rolled hoop and strip, stainless steel hoop and strip, copper-plated strip, skelp (tube strip).
Sales offices/agents: Sales office for various Armco products: Armco SA, Bd du Souverain 49, Bte 2, B 1160 Brussels (Tel: 02 660 69 90. Telex: 65314); also Armco SA Netherlands, c/o Flexal, 4927 SJ Hooge Zwaluwe.

Barres Cylindriques de Précision SA (Barcyl)

Head office: Rue des Prés 60, B 4520 Liège (Wandre). **Tel:** 041 62 78 47. **Telex:** 41405. **Cables:** Barcyl Wandre.
Management: René Pirlot de Corbion (directeur-général), Roger Giet (agent comptable). **Established:** 1908 **Capital:** BFr 20 million. **No. of employees:** 34.
Products: Bright bars ¼ to 6".

Usines Gustave Boël SA (UGB)

Head office: B 7100 La Louvière. **Tel:** 064 22 81 31. **Telex:** 57 228 boël b. **Cables:** Boël La Louvière.
Management: Yves Boël (président), Pol Boël (administrateur délégué), Jacques Boël (administrateur délégué). La Louvière: Jean Dargent (commercial director), Charles Staquet (commercial director), Henri Zunsheim (administrative director), Robert Nachtergaele (technical director). **Established:** 1851. **Capital:** BFr 1,440 million. **No. of employees:** 3,500 (works); 450 (office).
Works: La Louvière (head office). Coke ovens: Four Koppers batteries (179 ovens)

Prudential Steel Ltd

Head office: 1900-444 5th Avenue SW, Calgary, Alta. (Postal address: PO Box 1510, Calgary, Alta. T2P 2L6). **Tel:** 403 263 7820.
Management: J. S. Badyk (president), R. W. Osterkampf (senior vice president, operations), J. D. Wilson (vice president, sales), L. S. Thompson (vice president, secretary and treasurer), R. D. McIntosh (comptroller), H. G. Lanford (general sales manager). **Established:** 1966. **No. of employees:** 250 (works); 102 (office). **Ownership:** Wholly-owned by Dofasco Inc. **Subsidiaries:** Cardinal Tube Coatings Ltd (anti-corrosive pipe coatings).
Works: Calgary. Tel: 403 279 4401. Works director: R. W. Osterkampf. Pipe mill (2 to 10"), hollow structural mill (2 x 2" to 8 x 8") (annual capacity 98,000 short tons).
Products: Oil country tubular goods – ERW API line pipe 2 to 10¾" and oil country casing 2 to 9⅝"; hollow sections 2 x 2" to 8 x 8"; anti-corrosion coated tubular products.

QIT – Fer et Titane Inc

Head office: 1010 Sherbrooke Street West, Suite 700, Montreal, Que. H3A 2V2. **Tel:** 514 844 1592. **Telex:** 05 268575. **Cables:** Qit Mtl.
Management: W. W. Colville (chairman and chief executive officer), B. J. Grierson (president and chief operating officer), H. H. Jacobsen (vice president sales and marketing), S. F. Prest (vice president, technology and planning), T. F. Bowles (vice president, operations), H. A. Roy (vice president, finance), M. H. Thibodeau (vice president, human resources). **Established:** 1948. **No. of employees:** 940 (works); 732 (office). **Ownership:** The Standard Oil Co (an Ohio Corp). **Subsidiaries:** Quebec Metal Powders Ltd (100%) (produces high-grade iron powders), Richards Bay Minerals

Ferro Alloys Statistics

Compiled by Heinz H. Pariser
Alloy Metals & Steel-Market Research

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QIT - Fer et Titane Inc (continued)

(comprising Richards Bay Iron & Titanium (Pty) Ltd and Tisand (Pty) Ltd) (approx 40%) (produces titanium minerals, high-purity iron, rutile and zircon). **Associates:** GLC Canada Inc (producer of graphite electrodes).
Annual capacity: Pig iron 610,000 metric tons.
Works: PO Box 560, Sorel, Que. J3P 5P6. Tel: 514 742 6671. Telex: 05 267557. Works director: T. F. Bowles. Ironmaking plant: Nine electric furnaces (annual capacity 610,000 tons pig iron).
Products: Foundry pig iron (high quality); iron powder (high-grade); titania slag for the pigment industry; ilmenite ore.
Brands: Sorelslag (titania slag), Sorelmetal (high quality pig iron), Atomet (iron powders).
Sales offices/agents: QIT – Fer et Titane Division, 79 West Monroe Street, Suite 1110, Chicago, IL 60603, USA; QIT – Fer et Titane GmbH, Westendstrasse 8, D 6000 Frankfurt/Main 1, West Germany; QIT – Fer et Titane Inc, Japan and Far East Liaison Office, Landic Akasaka Bldg, 9th Floor, 3-4 Akasaka 2-chome, Minato-ku, Tokyo 107.

Quebec Metal Powders Ltd

Head office: PO Box 570, Sorel, Que. 3JP 5P7. **Tel:** 514 742 5911. **Telex:** 05 267442. **Cables:** Atomet.
Management: J. M. Shannon (director, operations), J. M. Capus (technical director), R. L. Edgar (director, sales and marketing). **Established:** 1967. **No. of employees:** 109 (works); 33 (office). **Ownership:** QIT-Fer et Titane Inc (100%). **Subsidiaries:** None.
Products: Iron powder – metallurgical, welding, cutting and scarfing, and magnetic inspection grades (output in 1982, 30,000 short tons).
Brands: Atomet (iron powder).
Sales offices/agents: At head office address; also at 15900 W. 10 Mile Road, Southfield, MI 48075, USA. QIT-Fer et Titane GmbH, Westendstrasse 8, D 6000 Frankfurt/Main 1, West Germany. QIT-Japan and Far East Liaison Office, Landic Akasaka Building, 9th Floor, 3-4 Akasaka 2-chome, Minato-ku, Tokyo 107, Japan (Tel: 3 587 27711. Telex: 2426723 tok j).

RF Systems Division, General Instrument of Canada Ltd

Head office: 65 Waverly Street, Delhi, Ont. N4B 1E8. **Tel:** 519 582 0710. **Telex:** 061 81174.
Management: R. Ramage (general manager), E. A. Laevens (general sales manager), K. John (operations manager). **Established:** 1951. **No. of employees:** 160 (works); 40 (office). **Ownership:** General Instrument Corp (wholly-owned).
Annual capacity: Finished steel (tubes): 25,000 short tons.
Works: Tube and pipe mills: HF mills for tube ⅝ to 3" o.d. (annual capacity 25,000 short tons).
Products: Galvanized tube and pipe 1 to 2⅜" o.d., 0·049 to 0·095" wall thickness.
Brands: Pre Galv., Deltube.

Sidbec-Dosco Inc

Head office: 507 Place d'Armes, Montreal, Que. H2Y 2W8. **Tel:** 514 392 7722. **Telex:** 05 24515 sidbec mtl.
Management: Interim chairman of the board of Sidbec and Sidbec-Dosco Inc: J. B. Lavigueur. Interim president and chief executive officer of Sidbec: J. LeBoutillier. President and chief operations officer of Sidbec-Dosco Inc: G. G. Charette. Vice presidents: T. E. Dancy (technology), R. Pallen (production), P. E. Landry (finance, control and administration, and treasurer), G. H. Laferrière (supply, transport and engineering), J. P. Picard (marketing and sales). **Established:** 1969. **No. of employees:** 2,750 (works); 250 (office). **Ownership:** Sidbec (100%). **Associates:** Sidbec-Feruni Inc (100%) (metal recycling). Sidbec International (100%) (export sales).

Sonco Steel Tube Ltd

Head office: 14 Holtby Avenue, Brampton, Ont. L6X 2M7. **Tel:** 416 451 2400. **Telex:** 06 97542.
Management: R. J. Atkinson (president and general manager), R. G. Stewart (vice president, sales and marketing). **Established:** 1952. **No. of employees:** 300 (works), 50 (office). **Ownership:** Jannock Ltd, Toronto (100%). **Subsidiaries:** U.S. Tubular Products Ltd (50%) (API end finishing and testing).
Annual capacity: Finished steel 300,000 long tons.
Works: Brampton (head office). Works director: David Thomas. Tube and pipe mills: ERW mills – four mechanical mills ⅜ to 3" dia, three structural mills 2 x 2" to 7 x 7" (annnual capacity 130,000 long tons).
■ 95 Van Kirk Drive, Brampton. Tel: 416 451 2400. Telex: 06 97542. Tube and pipe mills: ERW mills – one structural mill 12 x 12 x 0·625" wall thickness, and one API casing/line pipe mill to 8⅝" (annual capacity 170,000 long tons).
Products: Longitudinal-weld tube and pipe – mechanical tubing ⅜ to 3"; oil country tubular goods 2⅜ to 8⅝"; hollow sections 2 x 2" to 12 x 12".

Standard Tube Canada Inc

Head office: PO Box 430, Woodstock, Ont. N4S 7Y6. **Tel:** 519 537 6671. **Telex:** 064 74115.
Management: J. Sawkill (chairman), G. McCreery (president), W. A. Thompson (comptroller and director), T. J. Corrigan (general sales manager and director). **Established:** 1904. **No. of employees:** 700 (works); 225 (office). **Ownership:** Subsidiary of Tube Investments PLC, Birmingham, UK. **Subsidiaries:** None.
Works: Fourteen welded tube mills, range ½" o.d. x 20g to 8" o.d. x 0·500" wall thickness (annual capacity 150,000 short tons).
Products: Longitudinal-weld tube and pipe (mechanical and ERW boiler and pressure), DOM tubes, automotive parts, tubular and reduced wall axle housings, etc.

Stanley Steel Co Ltd

Head office: Gerrard Street, PO Box 66, Station B, Hamilton, Ont. L8L 7V2. **Tel:** 416 544 2803. **Telex:** 021 712.
Management: R. Weir (president and general manager), S. M. Johnston (vice president, sales and marketing), W.C. Hall (sales manager), E. C. Jones (controller), P. C. Brown (vice president, operations), R. J. Burt (manager, engineering). **Established:** 1916. **No. of employees:** 245. **Ownership:** Wholly-owned by The Stanley Works, New Britain, CT, USA. **Subsidiaries:** Stanley Strapping Systems Division.
Works: Hamilton, Ont. Rolling mills: One 4-high 20", one 2-high 18", one 6-high 920mm, one 18" temper. Slitting and annealing facilities.
Products: Hot rolled hoop and strip, precision cold rolled hoop and strip, oscillated strip coils.
Additional information: There is also a service centre operation in Hamilton, Ont. and Pointe Claire, Que. with slitting and shearing facilities.

Stelco Inc

Head office: PO Box 205, Toronto-Dominion Centre, Toronto, Ont. M5K 1J4. **Tel:** 416 362 2161.
Management: Chairman of the board and chief executive officer: J. P. Gordon. President and chief operating officer: J.D. Allan. Senior vice president: G. H. G. Layt. Vice presidents: A. J. Harris (engineering, research and purchasing), R. E. Heneault (administration), G. W. Bowlby (marketing), H. J. M. Watson (finance), J. E. Hood (operations), J. W. Younger (secretary and general counsel). **Established:** 1910. **No. of employees:** 18,111 (works); 5,971 (office). **Subsidiaries:** All wholly-owned: Stelco Fabricators Ltd, Regina, Sask. Frost Steel & Wire Co, Hamilton, Ont. Cloture Frost Inc-Frost Fence Inc, Montreal, Que. Durastal Installations Ltd, Montreal. Stelco Technical Services Ltd, Hamilton. Stelco Coal Co, Pittsburgh, PA, USA. Pikeville Coal Co, Louisville, KY, USA. Kanawha Coal Co, Ashford, WV, USA. Ontario Eveleth Co,

Stelco Inc (continued)

and finishing facilities at St. Henry Works (Montreal, Que.); equipment for cold drawing and finishing of bars at Canadian Drawn Works (Hamilton, Ont.). There are iron mines in Quebec, Labrador and Ontario, and in Minnesota and Michigan, USA; coal mines in Pennsylvania, West Virginia and Kentucky, USA, and a limestone quarry and lime kiln at Ingersoll, Ont.
Products: Steelmaking pig iron; carbon steel ingots, alloy steel ingots (incl. high-strength low-alloy), carbon steel slabs, alloy steel slabs, carbon steel blooms, alloy steel blooms, carbon steel billets, alloy steel billets; light angles and other light structural shapes, heavy angles, joists and other heavy structural shapes; reinforcing bars, round bars, bright bars; cultivator shanks, grader blades, grinding balls and rods, sucker rods; rail accessories (tie plates and track spikes); heavy plates and medium plates (sheared and torch cut); hot rolled coil/sheets, cold rolled coil/sheets, galvanized coil/sheets (incl. pre-painted), blackplate, electrolytic tinplate; longitudinal-weld tube and pipe (continuous weld, ERW, submerged arc weld), spiral-weld tube and pipe, seamless tube and pipe, line pipe, standard pipe, mechanical tubing, pressure tubing, oil country tubular goods; carbon steel wire rods (1,600lb coils); plain wire, galvanized wire, barbed wire, twisted, prestressed and strand wire, baling and bale ties, rails and staples, reinforcing fabric; fencing, fence posts and gates; bolts, nuts, rivets, washers, screws; pole line hardware; forgings; coke and coal chemicals.

Sysco – Sydney Steel Corp

Head office: PO Box 1450, Sydney, NS B1P 6K5. **Tel:** 902 564 5471. **Telex:** 019 35197. **Cables:** Systco.
Management: M. H. Cochrane (chairman of the board), E. A. Boutilier (acting president), C. F. Roach (vice president, employee relations), R. J. Skinner (secretary-treasurer), R. R. Hebert (director, marketing), W. J. Fewer (works manager), L. A. Chiasson (chief engineer), J. A. Strasser (director, metallurgy). **Established:** 1967. **No. of employees:** 1,300. **Ownership:** Province of Nova Scotia (Crown corporation).
Subsidiaries: Scotia Limestone Ltd.
Annual capacity: Pig iron 350,000 tons; raw steel 900,000 tons.
Works: Sydney (head office). Coke ovens: Two Koppers Becker batteries (114 ovens). Ironmaking plant: Blast furnaces – (No. 1) 6·25m hearth dia (annual capacity 350,000 tons), (No. 3) 6·55m hearth dia (idled). Steelmaking plant: Two 180/210-ton basic open hearth furnaces (900,000 tons). Continuous casting machines: Vöest-Alpine slab/bloom caster (1 slab, 3 bloom strands) (700,000 tons) – slabs to 300mm thick and 2·10m wide, blooms 400 x 300mm. Rolling mills: 40" blooming mill (850,000 tons), 7-stand billet mill (250,000 tons), 28" cross-country rail mill (300,000 tons).
Products: Carbon steel ingots, alloy steel ingots, carbon steel slabs, alloy steel slabs, carbon steel blooms, alloy steel blooms, carbon steel billets, heavy rails, rail accessories; metallurgical coke; light oil and tar.
Sales offices/agents: At head office address.
Expansion programme: C$96·2 million capital improvement programme includes rebuild and upgrading of No. 3 blast furnace, and upgrading in rolling mills.

Uddeholm Welded Stainless Pipe

Head office: 150 California Avenue, PO Box 756, Brockville, Ont. K6V 5W1. **Tel:** 613 342 8471. **Telex:** 066 36539.
Works: Tube and pipe mills: Mills for welded stainless pipe production (annual capacity 2,400 tons).
Products: Stainless steel tube and pipe (welded).

Union Drawn Steel Co Ltd

Head office: 135 Burlington Street East, PO Box 98, Hamilton, Ont. L8N 3A2. **Tel:** 416 547 4480.
Management: R. F. Hawkins (vice president and general manager). **Established:** 1905. **No. of employees:** 110 (works); 20 (office). **Ownership:** Subsidiary of

Union Drawn Steel Co Ltd (continued)

Republic Steel Corp, Cleveland, Ohio, USA.
Works: Hamilton (head office). Plant superintendent: J. P. Paliwoda. Bright bar production facilities including one coil block, one continuous coil drawing machine, draw-benches, two centreless turning machines, three centreless grinders, etc.
Products: Bright bars (carbon and alloy). Cold drawn rounds 3/16 to 4½", hexagons ¼ to 2¾", squares ¼ to 2¾", and flats ⅛ to 2" x ½ to 4½"; turned and polished rounds 1 to 4½"; ground and polished rounds 3/16 to 6". Heat treatments – stress relief, annealing, spheroidize annealing.
Brands: Supreme (precision ground shafting); Century Series (high-strength steels).

Western Canada Steel Ltd

Head office: 450 South East Marine Drive, Vancouver, BC V5X 2T2. **Tel:** 604 325 2271. **Telex:** 04 51178.
Management: M. C. D. Hobbs (chairman and chief executive officer), J. F. Stenhouse (vice president, manufacturing and general manager), H. B. R. Graves (vice president, sales), L. D. Parker (vice president, finance). **Established:** 1947. **No. of employees:** 500 (works); 100 (office). **Ownership:** Cominco (100%).
Subsidiaries: Richmond Steel Recycling Ltd (100%) (scrap merchants). Hawaiian Western Steel Ltd (51%) (steel bar production).
Annual capacity: Raw steel 330,000 short tons; finished steel 350,000 short tons.
Works: Vancouver (head office). Works director: I. R. Borland. Steelmaking plant: One 80-ton electric arc furnace (annual capacity 150,000 short tons). Continuous casting machines: 4-strand Rokop 5½" sq, 8" sq (250,000 tons). Rolling mills: Bar mill comprising 4-stand 18" continuous rougher, 16-stand 16" and 12" continuous (200,000 tons); bar mill comprising 4-stand 18" continuous rougher, 1-stand 16" intermediate feeding 5-stand 12" cross-country (120,000 tons). Other plant: Hot forging plant for carbon and light alloy steel fasteners (12,000 tons).
■ 2601 – 52nd Street S. E., Calgary, Alta. T2P 2J1. Tel: 403 272 4056. Telex: 038 22717. Works director: G. McGibney. Steelmaking plant: One 40-ton electric arc furnace (annual capacity 120,000 short tons). Rolling mills: Bar mill comprising 2-stand 18" roughing, 5-stand 12" cross-country (100,000 tons).
■ Hawaiian Western Steel Ltd, 91 – 150 Hanua Street, Ewa, Honolulu, HI 96706 (see separate entry).
Products: (Includes Hawaiian Western Steel Ltd) carbon steel ingots 5½ x 5½" (output in 1982, 217,000 short tons); reinforcing bars, round bars, and square bars (193,000 tons); rail accessories (6,000 tons); fasteners.

Chile

Cap – Cía de Acero del Pacífico SA—see Cía Siderúrgica Huachipato SA

Cintac – Cía Industrial de Tubos de Acero SA

Head office: Camino a Melipilla 8920, Santiago. **Tel:** 575070. **Telex:** 40256.
Management: Eduardo Almarza Pensa (chairman of the board), Patricio de Groote Perez (general manager), Hermann von Muhlenbrock Soto (executive vice president, finance), Patricio Giglio Gazzana (vice president, sales). **Established:** 1965. **Capital:** Pesos 366 million. **No. of employees:** 63 (works); 70 (office).
Subsidiaries: Industrias Metalúrgicas Aza SA (38·82%) (integrated rolling mill with electric furnace, billet continuous casting and bar rolling). Industria Nacional de Productos de Acero SA – Inproa, La Paz, Bolivia (34·4%) (tubes and light sections).
Annual capacity: Finished steel 60,000/65,000 tons.
Works: Santiago (head office). Works director: Neil C. Peebles. Tube and pipe mills:

Alpa – Aciéries et Laminoirs de Paris (continued)

bars 8 to 40mm (170,000 tons).
Sales offices/agents: Alpa, Z.I. Limay-Porcheville, BP 39, F 78440 Gargenville.

Sarl Aciéries & Forges d'Anor

Head office: F 59186 Anor. **Tel:** 027 60 11 19. **Telex:** 820665 afanor. **Cables:** Forges Anor.
Management: Jean-Claude V. Poitte (president), Raymond Rogier (sales manager, France), Michel Letoret (sales manager, export), Paul Herlin (production manager), Michel Jonas (metallurgical manager). **Established:** 1902. **Capital:** Fr 5·5 million. **No. of employees:** 160. **Subsidiaries:** Manufacturas Alfe SA, Bilbao, Spain (machine knives, guides for machine tools).
Works: Anor (head office). Works director: Jean-Claude V. Poitte. Steelmaking plant: Three induction furnaces – 750-kg, 500-kg and 100-kg; one 3,500-kg resistance furnace (annual capacity 900 tons per shift). Rolling mills: Universal reversing mill (4,000 tons per shift). Other plant: Foundry for stainless steels, heat resisting steels, and special cast iron.
Products: Stainless steel bars, alloy steel bars, flats 100 x 10mm to 350 x 60mm. Combined iron and steel bars; compound steel bars; machine knives; guides for machine tools; grinding machines.

Sté des Aciéries d'Anzin—see Vallourec SA

Armco SA

Head office: 4 Rue de l'Abreuvoir, F 92400 Courbevoie. **Tel:** 334 30 34. **Telex:** 602 306.
Management: C. de Charette (chairman and managing director, small diameter tubing division manager), P. Bunbury (finance manager), F. Brengues (human resources manager), J. Baeyens (construction products division manager), W. Geay (welding division manager), M. Hochon (special steels division manager), H. Floner (small diameter tubing plant manager), J. Kocalenios (construction products plant manager). **Established:** 1934. **Capital:** Fr 4 million. **No. of employees:** 454 (works); 130 (office). **Ownership:** Armco Inc, USA (99·9%) (see separate entry).
Products: Longitudinal-weld tube and pipe, pipes and culverts for civil engineering, welding equipment and products, metal buildings.
Brands: Armco, Lincoln, Union Carbide, Cecil, Bundy, SW, Eurotec.

Asfor—see Cie Française des Aciers Spéciaux

Aubert & Duval SA

Head office: 41 Rue de Villiers, F 92200 Neuilly-sur-Seine (BP 120, F 92202 Neuilly-sur-Seine). **Tel:** 758 11 62. **Telex:** 630556.
Works: F 63770 Les Ancizes (Puy-de-Dôme). Tel: 73 86 04 21. Telex: 390779. Steelmaking plant: Four electric arc furnaces from 3 to 60 tons; two groups of HF furnaces from 100kg to 6 tons; two vacuum induction furnaces; four consumable electrode furnaces. Rolling mills: One 800mm cogging, one 3-high 550mm, one 400mm, one 300mm, one rod. Other plant: Forging presses from 800 to 4,500 tons, hammers from 500kg to 5 tons; foundry.
Products: Alloy engineering steels, nitriding steels, valve steels, stainless and heat-resisting steels, high-temperature special alloys, tool steels, high-speed steels, steels and alloys for aerospace and nuclear applications. Forgings; castings, including alloy iron rolls.
Additional information: The company also has a works at 22 Rue Henri-Vuillemin, Gennevilliers (Hauts-de-Seine), and has an interest in Interforge (65,000-ton closed die forging press).

Terni – Stà per l'Industria e l'Elettricità SpA (continued)

Refining plant: One 70-ton AOD converter (90,000 tons). Continuous casting machines: One 8-strand Innocenti for billets (330,000 tons), one 2-strand Innocenti vertical type for slabs (200,000 tons), one 2-strand USSR vertical type for slabs (350,000 tons). Rolling mills: One semi-continuous wide hot strip mill consisting of 4/2-high reversing combination mill and 5-stand 4-high finishing mill (352,000 tons), three 4-high cold reduction mills (225, 000 tons), one bar mill (300,000 tons). Other plant: One Elkem reduction furnace for ferro-alloys (9,000 tons); foundry for steel castings up to 250 tons; forge and heat treatment shops – six forging and shaping presses (up to 12,000 tons) and thirty heat treatment furnaces; pressure vessels shop; penstock shop; heavy machining shop.
■ Via G. Paglia 45, I 24065 Lovere (formerly Italsider). Tel: 035 960010. Telex: 300125 terlov. Works director: O. Toso. Steelmaking plant: Three electric arc furnaces – one 40-ton (annual capacity 145,000 tons), two 6-ton (20,000 tons). Refining plant: One 40-ton Asea-SKF (145,000 tons). Rolling mills: Wagner mill for rings (18,000 tons), Schloemann mill for wheels up to 1,250mm dia (28,000 tons). Other plant: Steel foundry and forge.
■ Via di Servola 1, I 34145 Trieste (formerly Italsider). Tel: 040 8989. Telex: 460039. Works director: Mr. Sacerdote. Coke ovens: Four batteries (52 ovens) (annual capacity 330,000 tons). Sinter plant: One 42 cu m (580,000 tons). Ironmaking plant: Two blast furnaces – one 5·30m hearth dia, 570 cu m and one 5·70m hearth dia, 643 cu m (650,000 tons). One electric arc furnace (70,000 tons). Other plant: Foundry shop for ingot moulds and other castings (capacity 250,000 tons/year of ingot moulds) with average weight 16 tons, and ingot moulds of 3 to 40 tons.
Products: Foundry pig iron, ferro-silicon, stainless steel slabs, reinforcing bars, electrical sheets – grain-oriented, electrical sheets – non-oriented, stainless steel hot rolled band for rerolling, steel castings and forgings for electrical uses (rotors, turbine stators, hydraulic impellers and accessories) and for industrial uses; penstocks and pressure equipment for chemical, petrochemical and nuclear plants; railway wheels, tyres and axles.
Sales offices/agents: At works address and Via Alessandro Volta 16, Cologno Monzese, MI. Export sales organisation: Siderexport SpA, Viale Brigata Bisagno 2, Genoa. England and Poland -Guest Industrials Ltd, Wimborne House, 136 High Street, Sevenoaks, Kent, UK. West Germany – H. Lange GmbH, Schieggstrasse 18, Munich. Switzerland – Sidercom SA, Kanzleistrasse 80, Zürich. France – Marc Vincent, 40 Rue de Châteaudun, Paris. Austria and Czechoslovakia – Gebrüder Schoeller, Simmeringer Hauptstrasse 28, Vienna. Yugoslavia – Chimex, Via Paolo Reti 4, Trieste, Italy. USA and Canada – Siderius Inc, 1185 Avenue of the Americas, New York, NY. Denmark, Finland, Norway and Sweden – Oy Starckjohann & Co Ab Skandinavien, Kungsgatan 8, Helsingborg, Sweden.
Additional information: The Lovere and Trieste works formerly belonged to Italsider.

Terninoss – Acciai Inossidabili SpA

Head office: Viale B. Brin 171, I 05100 Terni. **Tel:** 4991. **Telex:** 660026.
Management: Managers: G. H. Ruffell (general), A. Franca (deputy general), A. Italia (commercial), G. Timpani (financial), G. Berni (works). **Established:** 1962. **Capital:** Lire 5,850 million. **No. of employees:** 1,190. **Ownership:** Terni – Stà per l'Elettricità p.A. (50%). United States Steel Corp (50%).
Works: Terni (head office). Works manager: G. Berni. Rolling mills: Four Sendzimir cold mills (annual capacity 125,000 tons); two skin pass mills; hot mill for plates (35,000 tons). Other plant: Three coil preparation lines; five annealing and pickling lines; re-heating furnace for slabs and hot rolled plates; plate roller-leveller; finishing facilities.
Products: Hot rolled stainless steel plates, over 3mm thick, max width 3,000mm, max length 12,000mm, max individual weight 4,000kg. Hot rolled stainless steel sheets and plates, 1·50 to 5mm thick, max width 1,300mm. Cold rolled stainless steel coil/sheets, 0·4 to 3·00mm thick, max width 1,300mm (finish No. 2D, 2B, 2BS, 3L, 4 grit 150/180). Cold rolled stainless steel hoop and strip in coils or sheets, 0·4 to

Mauritius

Desbro International Ltd

Head office: Plaine Lauzun, Port Louis. **Tel:** 084043; 083047. **Telex:** 4260 steel iw. **Cables:** Finance.
Management: Dennis A. Taylor (chairman), Francis Masson (managing director), Philip Rae (company secretary). **Established:** 1966. **Capital:** MRs 25 million. **No. of employees:** 300 (works); 20 (office). **Ownership:** Rogers & Co. **Subsidiaries:** None.
Annual capacity: Finished steel 30,000 tons.
Works: Rolling mills: 7-stand 12" rolling mill (annual capacity 24,000 tons), 6-stand 8" rolling mill (6,000 tons).
Products: Reinforcing bars 8 to 40mm (output in 1981, 10,000 tons).

Mexico

Aceros Anglo SA de CV

Head office: Electrificación 103, 50070 Toluca, Mex. **Tel:** 91 721 5 83 15.
Management: Carlos Lozano Peralta (general manager and president), Ernesto Gutierrez L. (assistant general manager), Alberto Ajuria Gonzalez (plant manager), Pedro Breton G. (sales manager). **Established:** 1963. **Capital:** Pesos 90 million. **No. of employees:** 189 (works); 90 (office). **Ownership:** Continental Copper & Steel Ind Inc (now CCX Inc) (100%).
Annual capacity: Finished steel 3,620 tons.
Works: Toluca (head office). Works director: Carlos Lozano. Steelmaking plant: One 2,000-lb Inductotherm MF furnace (annual capacity 1,200 tons); one 4,200-lb Pillar MF furnace (3,500 tons); one 1,200-lb Ajax MF furnace (432 tons). Rolling mills: 2-stand 14" mill (1,100 tons); 4-stand 10" mill. Other plant: 1,000-ton hydraulic press, one 8,000-lb hammer; one 3,000-lb hammer; no bake system foundry; complete cold finishing shop; ring rolling mill.
Products: Carbon steel ingots, alloy steel ingots and stainless steel ingots – 5 x 5" up to 20 x 20"; round bars ¾ to 14", square bars ¾ to 14" and flats ¾ x 1¼" to 2½ x 14" (output in 1981, 960 tons); forgings in stainless, alloy and carbon steel (4 to 8,000-lb); rolled rings (up to 80" o.d.).
Sales offices/agents: Gladiolas 304, Fracc. la Florida, Naucalpan, Mex.
Expansion programme: A 6-stand 16" bar mill (April 1983).

Ahmsa – Altos Hornos de México SA

Head office: Av. Juarez 90, 06040 Mexico, DF. **Tel:** 585 57 00. **Telex:** 01773892. **Cables:** Ahmsa Mexico.
Management: Directors: Miguel Alessio Robles (general), Sergio Romero Roaro (adjunto), Servando Chavez Quezada (secretario particular del director), Emilio Sacristan Roy (encargado de la dirección de finanzas y control), Jorge Tamayo (comercialización), Gustavo Garcia Guerrero (asuntos juridicos), Antonio Alonso Villaseca (adquisiciones), José Antonio Armendariz E. (empresas asociadas), Pedro Dieguez Garcia (evaluación y optimización), Arturo Ruiz de Chavez (relaciones industriales), Lorenzo Uscanga (materias primas), Ernesto Beyer Valverde (producción), Horacio Guerra (tecnico de expansión). **Established:** 1942. **Capital:** Pesos 17,153·25. **No. of employees:** 23,430 (works); 6,462 (office). **Subsidiaries and associates:** Companies in the Ahmsa group include – La Perla, Minas de Fierro SA de CV (iron ore mining and pelletization), Cía Carbonera La Sauceda SA de CV (coal mining), Cía Minera de Guadalupe SA de CV (coal mining), Cía Minera La Florida de Múzquiz SA de CV (coal mining), Minerales Monclova SA de CV (coal mining), Ahmsa Ingeniería SA (100%) (structural engineering and erection), Ahmsa – Fábrica Nacional de Máquinas Herramienta SA de CV (20·58%) (fasteners), Ahmsa Steel International

Sicartsa – Siderúrgica Lazaro Cardenas – La Truchas SA (continued)

enterprises). Jorge Tamayo (director of marketing). Arturo Ruis de Chavez (director of public relations). Gustavo Garcia Guerrero (director of legal affairs). Rodolfo Tapia Abarca (general manager. såles). Servando Chavez Quesada (secretary to the director general). **Established:** 1969. **Capital:** Pesos 12.400 million. **No. of employees:** 5.164 (works); 2.757 (office). **Ownership:** Mexican Government (51%). Nacional Financiera (25%). Ahmsa – Altos Hornos de México SA (6%). La Perla Minas de Fierro SA (6%). Fideicomiso del Gobierno Federal (12%).
Annual capacity: Pig iron 1.125.000 tons; raw steel 1.250.000 tons; rolled steel 1.000.000 tons.
Works: Cd. Lazaro/Cardenas. Mich. Tel: 3 2823; 3 2376. Telex: 017 74242. Coke ovens: Two by-product type batteries (60 ovens) (annual capacity 575.000 tons). Iron ore pelletizing plant: Lurgi travelling grate type (1.850.000 tons of blast furnace pellets). Ironmaking plant: One 9·0m hearth dia. 1.521 cu m (useful volume) blast furnace (1.125.000 tons). Steelmaking plant: Two 110-ton basic oxygen converters (1.300.000 tons). Continuous casting machines: Three 6-strand for billets 115 x 115mm and 125 x 125mm (475.000 tons each – combined capacity 1.100.000 tons). Rolling mills: One 4-strand wire rod mill (500.000 tons). one bar and light section mill (500.000 tons). Other plant: Iron ore concentrating plant (1.470.000 tons of iron ore concentrate); limestone calcining plant (102.000 tons of metallurgical lime); two 230 tons/day oxygen plants producing oxygen with 99·5% purity.
Products: Carbon steel billets. carbon steel wire rods and high-carbon steel wire rods (coil weight 1.500kg). reinforcing bars. round bars. square bars. flats. light angles. light tees. light channels. foundry pig iron and by product tar. ammonia sulphide. crude benzol and suplhur.
Expansion programme: The second stage. under construction. will produce 1.500.000 tpy of plate using direct reduction and ultra-high power electric arc furnaces.

Sidena – Siderúrgica Nacional SA

Head office: Av. Universidad y Miguel Laurent 803. Mexico 12. DF. **Tel:** 575 75 00.
Established: 1954.
Works: Ciudad Sahagún. Hgo. Steelmaking plant: Electric arc furnaces. Rolling mills: Three rolling mills. Other plant: Iron and steel foundry.
Products: Alloy steel bars; high-alloy steels. automotive grey iron castings. railroad steel castings. etc.

Sidermex SA de CV

Activities: State holding company for Ahmsa. Fundidora de Monterrey. and Sicartsa (see separate entries).

Acero Solar SA

Head office: Apartado Postal 64. Tlalnepantla. Edo. de Mexico. **Telex:** 1771218.
Established: 1958. **Ownership:** Mexican and US private investors . **Subsidiaries:** Procesos Termicos SA (tool and commercial heat treatment). Alambres Astro SA (stainless steel and heat-resistant alloy wire drawing plant).
Works: Tlalnepantla. Steelmaking plant: Includes: Two electric arc furnaces – one 10-ton (annual capacity 7.800 tons). and one 5-ton (1.200 tons); three induction furnaces – two 1·2-ton (1.200 tons) and one 0·25-ton (300 tons). Refining plant: One 10-ton AOD converter (8.000 tons). Rolling mills: 1-stand 2-high 20" billet mill (10.000 tons); 3-stand 3-high 16" heavy bar mill (1.000 tons); 4-stand 3-high 12" medium bar mill (2.500 tons); 9-stand 3-high and 2-high 10"/8" light bar mill (2.000 tons); 6-stand 3-high 12" breakdown mill and 8-stand 3-high 10" finishing mill (6.000 tons). Other plant: Steam and pneumatic hammers. High-alloy steel foundry.
Products: Stainless steel ingots; stainless steel billets; stainless steel bars; high-speed steels; stainless steel wire; tool steel bars. low-alloy bars. Coil weights 40kg and 80kg.

Philippines

Apollo Enterprises Inc

Head office: 818 E. Pantaleon Street, Mandaluyong, Metro Manila. **Tel:** 70 40 46-49. **Cables:** Apolosteel Manila.
Management: Johnny Cheng (chairman), Cheng Han Sui (vice chairman, president and general manager), Benjamin Sayhisek (vice president), Chong Kam Sang (treasurer), Chung Han Ching (assistant general manager), Miss Gadian Kua (sales), Miss Vicky Uy (purchasing). **Established:** 1969. **Capital:** Pesos 30 million. **No. of employees:** 230 (works); 43 (office).
Annual capacity: Finished steel 36,000 tons.
Works: Steelmaking plant: One 15-ton electric arc furnace (annual capacity 36,000 tons). Rolling mills: Bar mill comprising one 3-high 318mm roughing stand; four 267mm intermediate stands and one 267mm finishing stand (approx 18,000 tons).
Products: Carbon steel ingots (output in 1982, 27,500 tons); reinforcing bars – 10 to 36mm dia, structural grade 40 and grade 60 (16,800 tons).

Armco-Marsteel Alloy Corp

Head office: 2nd Floor, Alpap I Bldg, 140 Alfaro Street, Salcedo Village, Makati, Metro Manila. **Tel:** 818 1311-15; 817 3807; 818 5264. **Telex:** ETPI 64065 amacad pn; ITT 45582 amac pm; RCA 22495 armco ph. **Cables:** Armcosteel Manila.
Management: Matthew R. Holiday (country manager), Emmanuel V. Barbin (finance and administration manager), Norberto C. Perrin (commercial manager), Rolando A. Jaurigue (manufacturing manager), Jose R. Simeon (operating services manager), Rene R. Romero (purchasing manager). **Established:** 1973. **Capital:** Pesos 60·7 million. **No. of employees:** 352 (works); 60 (office). **Ownership:** Armco Inc, USA, and Philippine interests.
Annual capacity: Finished steel: 40,000 tons grinding media and 30,000 tons steel products.
Works: Taguig Steelworks, Napindan, Taguig. Tel: 6822217-21. Manufacturing manager: Rolando A. Jaurigue. Steelmaking plant: One 12 MVA 3·962m i.d. electric arc furnace (annual capacity 70,000 tons). Continuous casting machines: One 2-strand Concast for 160 x 200mm blooms and 100 x 100mm billets (110,000 tons). Rolling mills: 3-high 600 x 1,800mm breakdown mill and 8-stand 445mm and 380mm x 1,035mm continuous bar mill (120,000 tons).
■ Grinding Ball Plant, 555 T. Sora Avenue, Baesa, Novaliches, Quezon City. Tel: 90 26 81-5. Manager: Danilo L. Lozano. Ball forming plant – 2 roll-former machines with 2 bar reheat furnaces (capacities of 2 tons/hour and 5·3 tons/hour) (annual capacity 40,000 tons); heat treatment furnaces.
■ Construction Products Plant, Dr. Natividad Avenue, Napindan, Taguig, Metro Manila. Tel: 682 2217-21. Manager: Gregory W. Williams. Cut-to-length line for corrugated sheet; curving rolls; 200-ton press for flange and punch operation; slitter; 600-ton forming press.
Products: Carbon steel blooms and alloy steel blooms 160 x 200mm x 6m; carbon steel billets and alloy steel billets 100 x 100mm x 6m; round bars and alloy steel bars – 25mm, 30mm, 40mm, 50mm, 60mm, 75mm, 90mm, and 100mm dia; grinding rods and balls; large-diameter galvanized corrugated culvert 450 to 8,000mm dia.

Armstrong Industries Inc

Head office: 368 Rizal Avenue Extension, Corner 5th Avenue, Caloocan, Metro Manila. **Tel:** 353344; 353388; 353885; 343209; 343258; 361 8867. **Telex:** 27353 pwcc ph – Attn: Armstrong Ind. **Cables:** Amtsi Manila.
Management: Teddy Young (board chairman, president), Lorenzo Young (executive vice president), Tomas Cheng (vice president, finance). **Established:** 1966. **Capital:** US$1 million. **No. of employees:** 180 (works); 20 (office).

rods.
Works: Manggahan (head office). Plant manager: Andrew Y. Tong. Rolling mills: Fully automatic cross-country bar and rod mill (wire rod coil weight 88kg) (annual capacity 45,000 to 60,000 tons – depending on size mix).
Products: Carbon steel wire rods 7·8mm, 10mm, 12mm, 16mm dia; reinforcing bars 10mm, 12mm, 16mm, 20mm, 25mm; round bars 28mm, 32mm, and 36mm dia.

Philippine Blooming Mills Co Inc

Head office: PO Box 2040, 666 Muella de Binondo, Manila. **Telex:** 7423155.
Works: Steelmaking plant: Two 45-ton open hearth furnaces. Continuous casting machines: One 4-strand Mitsubishi for billets 75 to 115mm sq. Rolling mills: Bar/rod mills.
Products: Carbon steel billets, carbon steel wire rods, reinforcing bars.

Philippine Sinter Corp

Head office: 11th Floor, Allied Bank Center, Ayala Avenue, Makati, Metro Manila. **Tel:** 818 7221; 89 33 42. **Telex:** 752 722 2134. **Cables:** Sinter Mla.
Management: Shigeru Kamiya (chairman and president), Zensuke Yoda (executive vice president), Kiyoshi Nakoshi (vice president and treasurer), Gabriel Evangelista (vice president), Carlos G. Platon (secretary). **Established:** 1974. **Capital:** Pesos 500 million. **No. of employees:** 553 (works); 41 (office). **Ownership:** Kawasaki Steel Corp (100%). **Subsidiaries:** None.
Works: Phividec Industrial Estate, Misamis Oriental. Tel: 33 28. Telex: 7794 psc pu. Sinter plant: One 450 sq m strand Dwight Lloyd (annual capacity 5,000,000 tons). Limestone mine at Garcia-Hernandez, Bohol.
Products: Sintered iron ore (6 to 50mm) and limestone (200 to 3mm).

Republic Steel Tube Inc

Head office: Bo. Pamplona, Las Pinas, Metro Manila (Postal address: PO Box 3018, Manila). **Tel:** 828 14 16; 828 13 46; 828 40 22.
Management: Francisco S. Gaisano (executive vice president), Peter S. Gaisano (general manager), Felicisimo L. Yap (plant manager). **Established:** 1957. **Capital:** Pesos 2 million. **No. of employees:** 48 (works); 22 (office). **Ownership:** Filipino corporation owned 71% by Filipino and 29% by American interests. **Subsidiaries:** None.
Works: Las Pinas, Metro Manila (head office). Works director: Francisco S. Gaisano. Tube and pipe mills: Welded tube equipment (annual capacity 39,000 tons). Other plant: Pipe galvanizing equipment.
Products: Longitudinal-weld tube and pipe, galvanized tube and pipe for water – 6m standard length; diameters 15mm, 19mm, 25mm, 31mm, 33mm, 51mm, 73mm, 90mm; ISO Light Series II and ASTM Sched. 40.

Southern Industrial Projects Inc (SIP)

Head office: Arca Bldg, 1843 Taft Avenue, Pasay City, Metro Manila. **Tel:** 503941.
Management: Domingo Limoanco (president), Gregorio Concon (executive vice president), George Chua (purchasing), Sonny Camu (sales). **Established:** 1958. **Capital:** Pesos 12 million. **No. of employees:** 100 (works); 14 (office). **Ownership:** Arca & Co (70%).
Works: Cortes, Bohol. Works director: Jaime Bongato. Strip coating lines: Two galvanizing lines – 40" (annual capacity 24,000 tons), 50" (30,000 tons). Other plant: Colour-coating line (6,000 tons).
Products: Galvanized coil/sheets (output in 1982, 10,000 tons), colour-coated coil/sheets (2,000 tons), corrugated sheets (7,000 tons).

Aguinaco SA

Head office: Apartado 5, Mieres (Oviedo). **Tel:** 46 05 05; 46 35 11; 46 36 11.
Works: Mieres (Oviedo).
Products: Alloy, tool and stainless steels.

AHM – Altos Hornos del Mediterráneo SA

Head office: Paseo de la Castellana 83-85, Madrid 16. **Tel:** 455 84 54. **Telex:** 43940 ahmm e.
Management: Ricardo Díez Serrano (president). **Established:** 1971. **Ownership:** Instituto Nacional de Industria (INI – state-owned).
Works: Sagunto. Coke ovens: Three Otto type batteries with 15 ovens each (annual capacity 250,000 tons). Sinter plant. One Lurgi 90 sq m strand (1,100,000 tons). Ironmaking plant: Three blast furnaces – two 4·95m hearth dia (550,000 tons), one 5·5m hearth dia (300,000 tons). Steelmaking plant: Three 45-ton LD converters (900,000 tons). Continuous casting machines: 4-strand Concast for blooms 175 x 145mm to 290 x 290mm (250,000 tons); 1-strand Mannesmann-Demag for slabs 200 x 900 x 4,500mm to 20 x 1,600 x 14,000mm (450,000 tons) (to start up in 1983). Rolling mills: 2-high 1,006 x 2,743mm reversing blooming/slabbing mill (600,000 tons); 2-high 711 x 1,830mm structural mill (230,000 tons).
■ Sagunto (new works). Cold strip mill (annual capacity 1,300,000 tons).
Products: Coke (output in 1981, 255,952 tons); sinter (1,035,144 tons), steelmaking pig iron (584,385 tons), raw steel (637,661 tons), carbon steel slabs and carbon steel blooms (540,134 tons), joists and other structural sections (99,549 tons), cold rolled coil/sheets (440,625 tons).
Expansion programme: The new Sagunto works is planned to become Spain's fourth integrated steelworks with a capacity of 6,000,000 tons of flat products, but progress has been delayed.

AHV – Altos Hornos de Vizcaya SA

Head office: Carmen 2, Baracaldo (Vizcaya). **Tel:** 250 000. **Telex:** 33 777. **Cables:** Altos Hornos.
Established: 1902. **Ownership:** US Steel Corp holds 25%. **Subsidiaries:** Laminaciones de Lesaca SA, Agruminsa SA.
Works: Baracaldo-Sestao (Vizcaya). Coke ovens: Two Otto type batteries (29 ovens each) (annual capacity 304,000 tons), one Didier type battery (40 ovens) (240,000 tons), and one Didier type battery (50 ovens) (345,000 tons). Sinter plant: Three Dwight Lloyd – two 74·5 sq m strand (730,000 tons), one 102 sq m strand (1,022,000 tons). Ironmaking plant: Three blast furnaces – two 6·5m hearth dia (500,000 tons), one 9m hearth dia (800,000/1,100,000 tons). Steelmaking plant: Three 70-ton LD converters (1,340,000 tons); one 50-ton electric furnace (120,000 tons). Rolling mills: 2-high reversing blooming/slabbing mill (1,500,000 tons); 1,525mm semi-continuous wide hot strip mill (1,700,000 tons).
■ Echévarri. Rolling mills: Three single-stand 4-high cold reduction (863mm, 1,219mm and 1,219mm) (annual capacity 71,000 tons, 208,000 tons and 116,000 tons respectively); one 2-stand 1,219mm temper (272,000 tons). Strip coating lines: Electrolytic tinning line (100,370 tons), two Wean hot-dip tinning machines (22,060 tons), three Aetna-Abercarn hot-dip tinning machines (19,070 tons), and one Armco-Sendzimir continuous galvanizing line (106,000 tons).
Products: Metallurgical coke, sinter, steelmaking pig iron, foundry pig iron, carbon steel ingots, carbon steel slabs, carbon steel blooms, carbon steel hot rolled band for rerolling, cold rolled coil/sheets, galvanized coil/sheets, electrolytic tinplate.

Ajuria y Urigoitia SA

Head office: Araya (Alava).
Works: Araya (head office). Bar mill.
Products: Round bars, flats.

Grupo José María Aristrain SA (continued)

800mm section; Steckel mill for strip up to 450mm wide. Tube and pipe mills: Abbey Etna mill for tubes 2 to 6" dia; Yoder mill for tubes ⅜ to 1½" dia. Other plant: Tube galvanizing line.
Products: Carbon steel ingots, alloy steel ingots, heavy angles, joists, heavy channels, electrical sheets – non-oriented, hot rolled hoop and strip, skelp (tube strip), longitudinal-weld tube and pipe, galvanized tube and pipe.

Armco SA

Head office: Muntaner 374-376, Barcelona 6. **Tel:** 209 41 77. **Telex:** 52337; 53087. **Cables:** Armcosun.
Management: Juan A. Saldaña (manager stainless steel tubing and steel mill merchandising). **Established:** 1963. **No. of employees:** 600 (works); 100 (office).
Ownership: Subsidiary of Armco Inc, USA.
Products: Stainless steel tube and pipe 4 to 104mm dia.

Arregui SA

Head office: Portal de Gamarra 38, Apartado 177, Vitoria (Alava). **Tel:** 26 00 00. **Telex:** 35554 arrg e. **Cables:** Arreguisa.
Works: Vitoria (head office). Steelmaking plant: Electric arc. Continuous casting machines: One 4-strand Danieli/Continua for billets 90 to 160mm sq, 140 x 200mm. Rolling mills: Danieli strip mill; Danieli bar/section mill.
■ Tube Division, Urbina (Alava). Tube and pipe mills: Welded tube plant.
Products: Light sections; hot rolled hoop and strip; longitudinal-weld tube and pipe.

Arsa SA

Head office: Carretera de Barcelona km 10, Museros (Valencia) (Postal address: Apartado 1842, Valencia). **Telex:** 62952 saar e.
Works: Bar mill.
Products: Round bars.

Artierro SA

Head office: Camino de Silla a Beniparrell s/n, Apartado Correos 47, Silla (Valencia). **Tel:** 120 08 00. **Telex:** 62266 tier e. **Cables:** Artierro.
Ownership: José María Aristrain group.
Works: Silla (head office). Steelmaking plant: Electric arc. Continuous casting machines: One 3-strand Continua for billets 90 to 130mm sq. Rolling mills: Bar mill.
Products: Reinforcing bars.

Astilleros Españoles SA (Aesa)

Head office: P. Castellana 178, Madrid 16. **Tel:** 250 85 01; 250 85 05. **Telex:** 44484 mlsa e. **Cables:** Astilleros Madrid.
Works: Reinosa (Santander). Steelmaking plant: Electric arc furnaces. Refining plant: ESR, VOD and vacuum degassing units. Rolling mills: For bars and plates.
■ Asua, Bilbao. Steel foundry.
Products: Carbon steel billets, alloy steel billets, stainless steel billets; stainless steel bars, alloy steel bars; heavy plates, medium plates, stainless steel plates; bearing steels and tool steels. Castings and forgings.

Apollo Steels (continued)

in-line finishing train (annual capacity 60,000 tons).
■ Globe Works, Alma Street, Sheffield. Tel: 0742 755050. Telex: 547687. Works director: J. T. Barker. Rolling mills: Brightside double-duo 12" (annual capacity 20,000 tons).
Products: Round bars 11 to 25mm (output in 1981-2, 4,000 tons), flats 16 x 8mm to 100 x 40mm (36,000 tons), stainless steel bars, alloy steel bars; spring steels (rounds 11 to 25mm, flats 16 x 8mm to 100 x 40mm) (31,000 tons).
Sales offices/agents: At head office address. Belgium: Daval SA, Rue de Livourne 80, B 1050 Brussels. USA: FD Metals USA Inc, 407 Maryland Trust Bldg, Calvert/Redwood Streets, Baltimore, MD 21202.

Armco Ltd

Head office: Jubilee Road, Letchworth, Herts. SG6 1NQ. **Tel:** 046 26 6588. **Telex:** 825040. **Cables:** Armco Letchworth.
Management: P. Nightingale (managing director), B. D. Green (director, tubing), A. Bransbury (finance manager and company secretary), M. P. Houghton (manager, personnel). **Established:** 1931. **Capital:** £450,000. **No. of employees:** 520.
Ownership: Wholly-owned by Armco Inc, USA.
Works: Letchworth (head office). Tube and pipe mills: Armco single weld tube mill; Bundy double wrap tube mill. Other plant: Electro-galvanizing line, tin/lead tube coating line, zinc coating line for tubing.
■ Newport. Tel: Newport 73081. Plant manager: W. R. Wardle. Hot-dip galvanizing facilities; hot-dip bitumen coating facilities.
Products: Double-wall copper brazed tubing – 3 to 12mm in straight lengths, coils or manipulated parts, in copper, tin/lead or electro-galvanized zinc finish (Armco Bundy brand); single wall longitudinal-weld tube and pipe 4·75 to 12mm in straight lengths, coils or manipulated parts, all in plain steel, copper or hot-dip zinc finish (Armco S.W. brand).
Brands: See above.
Companies represented on agency basis: Head office. Represented throughout the world by Armco International Div. of Armco Steel Corp.

Armstrong Tube Co Ltd

Head office: Gibson Lane, Melton, North Ferriby, North Humberside HU14 3HY. **Tel:** 0482 633311. **Telex:** 52164.
Management: Alan Langthorp (tube mill manager). **Established:** 1974. **Capital:** £7·5 million. **No. of employees:** 50. **Ownership:** Armstrong Equipment Lt.
Subsidiaries: None.
Works: Shipton Road, York. Tel: 0904 59833. Telex: 57826. Works director: B. Foster. Tube and pipe mills: Two tube mills – one AEF for 3" dia max; one AEF for 3½" dia max (annual capacity (10,000,000 metres). Other plant: Draw-benches, 2 to 1½" dia max (2,000,000 metres)
Products: Longitudinal-weld tube and pipe and cold drawn tube 1½ to 3½" dia.
Sales offices/agents: At works address.

Ash & Lacy Steel Products Ltd

Head office: Shaw Street, Hill Top, West Bromwich, West Midlands B70 0TX. **Tel:** 021 556 4211. **Telex:** 336239.
Management: Directors: M. J. L. Cartwright (managing), J. Darroch, D. S. L. Fletcher (also director, Ash & Lacy Group), J. F. Vernon (also director, Ash & Lacy Group). Managers: I. Parkes (project sales), S. J. Durden (commercial). **Established:** 1971. **No. of employees:** 75 (works); 25 (office). **Ownership:** Ash & Lacy Ltd, Alma Street, Smethwick, Warley, West Midlands.
Products: Galvanized coil/sheets, pre-painted and colour-coated coil/sheets (for roofing and cladding).
Brands: Ashclad; Floclad; Geoclad.

Barworth Flockton Ltd

Head office: Johnson Lane, Ecclesfield, Sheffield S30 3XH. **Tel:** 0742 468291. **Telex:** 54657.
Management: Directors: R. Hulley (chairman), W. N. Edwards (managing), A. J. Briggs (financial), H. Appleby. **Ownership:** Barworth Holdings Ltd, Sheffield. **Subsidiaries:** Moss & Gamble Bros Ltd.
Annual capacity: Rolled steel 2,000 tons.
Works: Sheffield (head office). Steelmaking plant: One 20-cwt HF furnace (annual capacity 993 tons). Other plant: One 1-ton Massey cogging hammer; one GFM forging machine (type SX16 – 40mm to 140mm capacity); 800-ton forging press; centreless grinding and bar turning machines; bar treatment furnaces.
■ Little Matlock, Sheffield 6. Tel: 343119. Rolling mills: 10" hand mill for high-speed and tool steel (annual capacity 900 tons).
Products: Alloy steel billets, forgings, alloy bright bars and alloy steel bars (black) – high-speed steels and alloy tool steels.

Beam Tubes Ltd

Head office: Moulton Park Industrial Estate, Northampton NN3 1QQ. **Tel:** 0604 48246.
Management: Directors: L. McGibbon (chairman), J. A. Langley (managing), P. L. Jones, A. G. Newman (secretary), D. J. Bull. **Established:** 1971. **Ownership:** Jones Stroud (Holdings) Ltd.
Works: Northampton (head office). Three welded tube mills.
Products: Longitudinal-weld tube and pipe 8 to 38mm dia. Aluminium-coated steel tubes 8 to 38mm dia.
Additional information: The company also has a manipulation department for steel tubes – drilling, punching and swaging. Another works at Rogersthorpe Crescent, Northampton, produces welded aluminium tubes.

Bedford Steels Ltd

Head office: 151 Effingham Road, Sheffield S4 7YS. **Tel:** 0742 79643. **Telex:** 54172. **Cables:** Bedsteels Sheffield.
Management: W. R. Pickering (chairman), D. L. Oldale (financial director and company secretary), J. A. Wade (managing director), E. B. N. Fearn (director). **Established:** 1972. **Capital:** £100. **No. of employees:** 125 (works); 25 (office). **Ownership:** Gardner Denver Holdings (UK) Ltd, Dronfield, Sheffield. Ultimate parent company: Cooper Industries Inc, Houston, Texas, USA. **Subsidiaries:** None.
Annual capacity: Finished steel 25,000 tons.
Works: Sheffield (head office). Works manager: B. Duffy. Rolling mills: 305mm double-duo mill (annual capacity 20,000 tons), 228mm 3-high mill (5,000 tons). Other plant: Facilities for centreless bar peeling/turning and precision grinding, billet boring, core extraction, reeling and cold sawing.
Products: Black round bars (output in 1981, 3000 tons) – including bolt, nut and rivet; bright drawing quality black bars; heat-treated bars; hexagon, octagon, round and square bars; flats, half-round and three-square – mostly file steel (output in 1982, 2,200 tons); valve steel for motor vehicles; centreless ground alloy steel bright bars; stainless steel bars; alloy steel bars; mining drill steels, hollow or solid; alloy steel tube and pipe, hollow bar, precision tube and hollow sections (output in 1981, 5,000 tons); stainless steel lined hollow bar; leaded steels and spring steels.
Brands: Bedrock (material specified for rock-drilling steel).
Sales offices/agents: At head office. Agents: National Compressed Air Ltd, 1165 Fewster Drive, Mississauga, Ont., Canada. T. F. Schultz KG, Ross Strasse 13, D 4000 Düsseldorf 30, West Germany. Klöckner & Co. Stahl Ausland, PO Box 100105, Mulheimer Strasse 54, Duisburg 41, West Germany.

Byard Kenwest Engineering Ltd

Head office: Muir Road, Livingston, West Lothian EH54 5DS, Scotland. **Tel:** Livingston 32882. **Telex:** 72685.
Management: Directors: R. G. Alexander (managing), S. H. Doughty, A. Jack. **Established:** 1964. **Capital:** £82,500. **No. of employees:** 45 (works); 11 (office).
Ownership: Wholly-owned by Richard Costain Ltd, London.
Works: Livingston (head office). Works director: A. Jack. Tube and pipe mills: Byard spiral-weld 406·4 to 3,048mm (annual capacity 24,000 tons).
Products: Spiral-weld tube and pipe and large-diameter pipe in sizes from 406·4 to 3,048mm dia. Byard spiral-weld pipe mills (for export only) capable of manufacturing pipe from 406·4 to 3,048mm dia in thicknesses up to 25mm.
Sales offices/agents: Davidson & Pearson, Victoria House, 2 Crown Lane, Morden, Surrey SM4 5BL.

Cameron Iron Works Ltd

Head office: Stourton, Leeds, Yorks.
Management: W. B. Campbell (director, forged products division), D. Gilbreath (director, ball valve division), L. Hoes (director, oil tool division), J. Beattie (financial director). **Established:** 1954. **No. of employees:** 1,500 (works); 300 (office).
Ownership: Cameron Iron Works Inc, Houston, Texas, USA.
Annual capacity: Finished steel 20,000 tons.
Works: Livingston, West Lothian, Scotland. Tel: 0506 31122. Telex: 72434. Works director: W. B. Campbell. Steelmaking plant: One 10-ton vacuum induction furnace (annual capacity 3,500 tons). Refining plant: Three VAR units (3,500 tons). Other plant: 30,000-ton extrusion press/forging press; 9,000-ton forging press.
Products: Seamless tube and pipe, large-diameter pipe, stainless steel tube and pipe, alloy steel tube and pipe; closed die forgings up to 15 tons.
Sales offices/agents: Livingston, West Lothian, Scotland.

C. G. Carlisle & Co Ltd

Head office: 629 Penistone Road, Sheffield, Yorks. **Tel:** 346161. **Telex:** 54411 cgc sf g.
Established: 1922. **Ownership:** C. F. Booth group.
Works: Sheffield, Rotherham and Barnsley. Steelmaking plant: One 6-ton electric arc furnace. Refining plant: One 6-ton AOD converter. Rolling mills: Bar mills.
Products: Stainless steel billets; stainless steel bars.

Richd W. Carr & Co Ltd

Head office: Pluto Works, Wadsley Bridge, Sheffield S6 1LL. **Tel:** 0742 349451. **Telex:** 54416.
Management: R. H. Granville Carr (chairman), W. J. Denys Carr (managing director), Harold S. Walker. **Established:** 1902. **Capital:** £450,000. **No. of employees:** 305 (works); 135 (office). **Subsidiaries:** G. P. Wall Ltd, Sheffield. F. M. Parkin (Sheffield) Ltd, Sheffield.
Works: Sheffield (head office). Works director: R. G. Rotchell. Steelmaking plant: One 5-ton Inductotherm induction furnace (annual capacity 9,000 tons), one 2-ton Birlec HF furnace (3,000 tons), one 1-ton Birlec HF furnace (3,000 tons).
■ Loxley Road, Wisewood, Sheffield 6. Tel: 343861. Works director: R. G. Rotchell. Seven forging hammers.
■ Blast Lane, Sheffield 2. Tel: 752998. Works director: R. G. Rotchell. Rolling mills: One 2-high 8" guide jobbing mill, one 2-high 12" hand jobbing mill, one 3-high 14" mill.
Products: Carbon steel ingots, alloy steel ingots, stainless steel ingots, round bars, square bars, flats, bright bars, stainless steel bars, alloy steel bars, high-speed steels, tool steel.
Brands: Pluto and Motor.
Sales offices/agents: James Watt Industrial Park, Rabone Lane, Smethwick, Warley

Fine Tubes Ltd

Head office: Estover Works, Plymouth, Devon, PL6 7LG. **Tel:** 0752 775851. **Telex:** 45252. **Cables:** Fine Tubes Plymouth Telex.
Management: Directors: T. M. Barclay (managing), H. T. Daudje[illegible]financial), J. G. Gwatkin (non-executive director), A. R. Henning (marketing), P. R. Boyce (technical & engineering director), B. W. Cook (general manager, operations). **Established:** 1940. **Capital:** £108,291. **No. of employees:** 350 approx. **Ownership:** Superior Tube Co, Norristown, PA, USA (£108,290 share of capital). **Subsidiaries:** None.
Products: Seamless and longitudinal-weld precision tube up to 35mm o.d. in carbon and alloy steels, stainless steels, nickel, nickel alloys, titanium and titanium alloys, nickel iron alloys and cupro nickel alloys.
Sales offices/agents: Head office address. Italy: A. Mauceri. India: Paul Enterprises. West Germany: Bruno Dockweiler. Sweden: Elof Hansson; Harald Pihl.
Expansion programme: Progressive – on existing site.

Firsteel Ltd

Head office: Brockhurst Crescent, Bescot, Walsall WS5 4AX. **Tel:** 0922 27621. **Telex:** 338569. **Cables:** Firsteel Walsall.
Management: Chairman: H. J. Nash. Directors: J. V. Palmer (managing), W. M. Sheldon (financial), K. T. Jones (production), J. S. Wilson (works), W. D. Davies (sales), H. H. Jones. **Established:** 1937. **Capital:** £285,175. **No. of employees:** 62 (works); 35 (office). **Ownership:** Wholly-owned by Firsteel Manufacturing Ltd (a subsidiary of Lonrho PLC).
Annual capacity: Rolled steel 24,000 tons.
Works: Bescot (head office). Works director: J. S. Wilson. Rolling mills: One Farmer Norton 4-high 150 x 100 x 350mm reversing mill (annual capacity 14,000 tons), one Farmer Norton 4-high 210 x 500 x 600mm reversing mill (17,000 tons), one Farmer Norton 4-high 160 x 350 x 300mm reversing mill (11,000 tons), one Farmer Norton 2-high 400 x 600mm non-reversing mill (21,000 tons). Strip coating lines: One tandem oven coating line 510mm wide, producing painted, plastic and laminated finishes, 0·01 to 1·2mm thick. Other plant: One pickle line for material 500mm wide, 1·2 to 6mm thick; one wide slitting line for material 1,200mm wide, 4·5mm thick; three finishing slitting lines for material, 300mm, 450mm and 600mm wide; one 15 head precision slitter; two flattening and cut-to-length lines (total annual capacity 29,000 tons).
Products: Cold rolled hoop and strip up to 530mm wide and 0·25 to 4mm thick, in coils or sheets – bright, matt or galvanized hoop and strip, to low and medium carbon specifications. Organic coated strip including colour-coated coil/sheets (steel, aluminium and other metals) – paint, lacquer, plastisol or organosol, and PVC film coatings, up to 500mm wide, 0·15 to 1·2mm thick, in coils, straight lengths or blanks.
Brands: Firsteel (cold rolled bright, matt or electro-galvanized steel).

Firth Brown Ltd—see Sheffield Forgemasters Ltd

Firth Cleveland Steel Strip Ltd

Head office: Locarno Road, Tipton, West Midlands DY4 9SE. **Tel:** 021 557 6871. **Telex:** 339011.
Management: D. R. Moylan (managing director), G. F. Wright (sales director), C. D. Gladwin (technical director), F. M. Stearn (works director), P. H. Garfunkel (director), D. A. Lawford (director, secretary). **Established:** 1948. **Capital:** £100,000. **No. of employees:** 200. **Ownership:** Member of GKN Group.
Works: Locarno Road (head office). Rolling mills: Cold rolling mills. Other plant: Continuous hardening and tempering furnaces; pickling plant; annealing furnaces; rotary slitters.
Products: High-carbon and alloy steel cold rolled hoop and strip including hardened and tempered.
Brands: Fircleve.

Firth Cleveland Steel Strip Ltd (continued)

Sales offices/agents: USA: Firth Cleveland Steels Inc. 1133 Avenue of the Americas. New York. NY 10036. USA.

Firth Vickers Special Steels Ltd—see Sheffield Forgemasters Ltd

Flather Bright Steels Ltd—see British Bright Bar Ltd

Stewart Fraser Ltd

Head office: Henwood Industrial Estate. Ashford. Kent. **Tel:** 0233 25911.
Management: Directors: P. A. Fraser (managing). S. M. Davies. B. O. Mahoney. C. R. Middleton (technical). B. D. Hicks (works). **Established:** 1947. **No. of employees:** 90 (works): 30 (office). **Ownership:** Private.
Works: Ashford (head office). Works director: B. D. Hicks. 14 pass x 10g cold roll-forming line (annual capacity 2.000 tons). 14 pass x 10g cold roll-forming line (1.000 tons). 10 pass x 12g cold roll-forming line (290 tons) and 16 pass x 10g cold roll-forming line (2.000 tons).
Products: Cold roll-formed sections.

Fulton (TI) Ltd

Head office: Halesfield. Telford. Shropshire TF7 4ET. **Tel:** 0952 586301. **Telex:** 35344.
Established: 1963. **Ownership:** TI Group PLC. ITT/Higbie Mfg.. USA.
Works: Brazed and welded tube mills (annual capacity 30.000.000m).
Products: Brazed steel tube (4·76 to 9·53mm o.d. x 0·71mm wall thickness) and longitudinal-weld tube and pipe (4·76 to 12·7mm o.d. x 0·71 wall thickness) – self colour. zinc plated. terne coated. and polymer coated. Fabricated products for the automotive and refrigeration industries.
Brands: Ful-Braiz: Ful-Wel.
Sales offices/agents: Sales offices: At head office. Also TI International Ltd. TI House. Five Ways. Birmingham B16 8SQ (Tel: 021 454 4838. Telex: 336413).

George Gadd & Co – Glynwed Steels Ltd

Head office: Blackbrook Road. Woodside. Dudley. West Midlands. **Tel:** 0384 77111. **Telex:** 339667. **Cables:** Gadds Dudley West Midlands.
Management: Directors: W. Devney (managing). R. Gresswell (commercial and financial). A. W. Rudge (sales). **Established:** 1865. **Capital:** £120.000. **No. of employees:** 98 (works): 25 (office). **Ownership:** Glynwed International PLC. Birmingham.
Annual capacity: Finished steel: 75.000 tons.
Works: Dudley (head office). Rolling mills: 10" section/bar mill (annual capacity 27.000 tons) and 14" section/bar mill (48.000 tons).
Products: Round bars 19 to 65mm (output in 1981 18.000 tons): square bars 19 to 60mm (6.000 tons): flats 25 x 6mm to 80 x 28mm (10.000 tons): hexagonal bars (3.000 tons): light angles 50 x 50 x 6mm to 60 x 60 x 6mm (2.000 tons): special sections (2.000 tons).

Joseph Gillott & Sons – Glynwed Steels Ltd

Head office: Hercules Works. Wharf Road. Kilnhurst. Rotherham. South Yorkshire S62 5ST. **Tel:** 0709 582986. **Telex:** 547387.
Management: W. Devney (managing director). P. Bunting (commercial manager) R. Mullis (works manager). **Established:** Over 100 years. **No. of employees:** 48 (works): 12 (office). **Ownership:** Glynwed International PLC. Birmingham.

H. H. Robertson (UK) Ltd

Head office: Cromwell Road, Ellesmere Port, South Wirral, Cheshire. **Tel:** 051 355 3622; 051 355 7151 (export). **Telex:** 629639.
Management: C. E. Dyer (managing director), G. A. Antrobus (general manager, export), C. A. Holme (general manager, UK), M. M. McCarthy (purchasing manager).
Established: 1922. **Capital:** issued: £276,402. **No. of employees:** 720.
Ownership: H. H. Robertson Inc, Pittsburgh, PA, USA.
Works: Ellesmere Port (head office).
Products: Cold roll-formed sections; galvanized coil/sheets up to 1,174mm; colour-coated coil/sheets.
Brands: Trisomet (composite panel); Formawall (insulated flat panel); Versacor (roof and wall protected sheeting); Novaclad (roof and wall protected sheeting).
Sales offices/agents: At head office address.
Additional information: Member of European Coil Coating Association.

Sanderson Kayser Ltd

Head office: Attercliffe Steelworks, PO Box 6, Newhall Road, Sheffield S9 2SD. **Tel:** 0742-449994. **Telex:** 54194. **Cables:** Sanderson Sheffield.
Management: Directors: J. B. Elwell (chairman), W. McMurray (managing), M. J. Heeley, E. Walker, T. Worrall. Secretary: P. R. Andrews. **Established:** 1776.
Capital: Authorised: £1·8 million. Issued: £1·7 million. **No. of employees:** 392 (works); 132 (staff). **Ownership:** Wholly-owned subsidiary of GEI International PLC.
Subsidiaries: All wholly-owned: Sanderson Brothers & Newbould Ltd, Sheffield (non-trading); Sanderson Newbould (Australia) Pty Ltd – Melbourne and Sydney, Australia (representatives and stockists); Sanderson-Newbould Ltd – Montreal and Toronto, Canada (representatives and stockists); Sanderson Kayser Holdings (S.A.) (Pty) Ltd, Johannesburg, South Africa (non-trading); Sanderson Newbould S.A. (Pty) Ltd, – Johannesburg, Durban and Cape Town, South Africa (representatives and stockists); Sanderson Technitool (Pty) Ltd, Johannesburg, South Africa (toolmakers); Energy Properties (Pty) Ltd, Johannesburg, South Africa (non-trading); Kayser, Ellison & Co Ltd, Sheffield (non-trading); Francis Bros. (Drop Forgers) Ltd, Sheffield (manufacturers of drop forgings) (non-trading); Kerfux Investments (Pty) Ltd, Johannesburg, South Africa (non-trading).
Works: Sheffield (head office). Steelmaking plant: Two HF induction furnaces – 20-cwt and 12-cwt. Rolling mills: One 6-stand 10½" double-duo bar mill; one 5-stand 14" bar mill; two 2-stand sheet mills producing tool, die and other special steels. Other plant: Forge – steam hammers from 8-cwt to 3-ton producing tool, die and other special steels. Bar heat-treatment plant. Heavy and fine wire drawing blocks; centreless grinding and centreless turning machines. Department for production of machine knives, shear blades, saws and hacksaw blades.
■ Darnall, Sheffield 9. Tel: 0742 441175. Telex: 54194. Steelmaking plant: Two electric arc furnaces – one 10-ton and one 15-ton. Refining plant: One 750 kVA electro-slag unit. Rolling mills: 30" reversing cogging mill; one 4-stand 14" mill; one 13-stand wire rod mill producing coil and rod in special steels. Other plant: Forge – one 1,000-ton direct water pump driven forging press producing tool, die and other special steels. Bar heat-treatment plant. Atmosphere controlled furnace for bright annealing of wire and rod; bright softening furnace for stainless wire; descaling plant.
Products: Rolled or forged heat-treated black bar, mainly round bars, square bars and flats, including high-speed steels, tool, die and stainless steel bars; hot rolled coiled wire rod, including alloy steel wire rods and stainless steel wire rods 5·5 to 16mm dia; drawn wire in coils 0·012 to 9/16" dia (0·3 to 14mm); drawn wire in lengths 1/16 to 9/16" (1·5 to 14mm); bright bars – centreless ground 0·079 to 3½" dia; centreless turned ¾ to 3½" dia; silver steel to BS1407; drill rod; forged discs, rings and blocks for dies and moulds; mint die forgings; small sleeve forgings, extended shaft forgings, single and double boss forgings, round drop forgings 1 to 8 lb (0·45 to 3·6kg); pre-machined tool steel bar and ground flat stock; hardened and tempered machined plate; saw plate; composite iron and steel for machine knives; machine knives and shear blades; circular segmental saws for metal; hot saws; woodsaws; hacksaw blades.

TI Tubes Ltd

Head office: Rocky Lane, Aston, Birmingham B6 5RH. **Tel:** 021 359 3030. **Telex:** 337443.
Management: Directors: R. Underhill (director and general manager), R. Gullick (sales and marketing director), D. Gooden (financial director), D. Crawford (personnel director). **Ownership:** Member of TI Group.
Works: Aston (head office). Draw-benches; honing, polishing and straightening facilities. Forging department.
Products: Oil country tubular goods- forged-end tubulars up to 5" o.d., cold drawn tube 50 to 275mm o.d. Specially finished tube for fluid power cylinders and piston rods – honed bore tube, roller burnished tube, centreless ground tube (32mm bore, 275mm o.d.), cold drawn seamless tube in carbon and low-alloy steels for mechanical applications, cold drawn welded tube (dom) (150 to 275mm o.d.). Upset and swaged tubular and solid forgings (25 to 500mm o.d. and 200 to 10,000mm length).
Brands: HYTUBE (tube for fluid power applications).
Sales offices/agents: Head office address. Also TI International Ltd, TI House, Five Ways, Birmingham B16 8SQ (Tel: 021 454 4838, Telex: 338031-4) – represented throughout the world.

TI Weldless Ltd

Head office: Waddens Brook Lane, Wednesfield, Wolverhampton, West Midlands WV11 3SQ. **Tel:** 0902 731601. **Telex:** 338661.
Management: Directors: N. E. Price (managing), R. A. Gregory (commercial), N. H. Burton-Carter (financial), B. L. E. W. Minors (personnel), S. Robinson (engineering), D. G. Harris (production), B. Corlett (production services). **Established:** 1872. **No. of employees:** 700 (works); 300 (office). **Ownership:** Member of the TI Group.
Works: Wednesfield (head office). Tube and pipe mills: One continuous mill 33·4 to 127·0mm o.d., 3·25 to 16·0mm thick (annual capacity 150,000 tons); two Pilger mills 101·6 to 244·5mm o.d., 4·9 to 50·8mm thick (30,000 tons); one cold drawing unit 25·0 to 114·3mm o.d., 2·5 to 12·7mm thick (30,000 tons).
Products: Seamless tube and pipe 33·4 to 244·5mm o.d. (output in 1981, 113,000 tons); oil country tubular goods 1·66 to 9⅝" (19,000 tons); alloy steel tube and pipe 33·4 to 244·5mm o.d. (8,000 tons); cold drawn tube 25·0 to 114·3mm (14,000 tons); hollow bar (1,000 tons); precision tube 25·0 to 114·3mm; hollow sections for redrawing 33·4 to 244·5mm o.d. (45,000 tons).
Brands: Wellpro (oil country tubular goods); Drilmax (mineral drilling tubulars).
Sales offices/agents: At head office address; also TI International Ltd, Five Ways, Birmingham B16 8SQ (Tel: 021 454 4838. Telex: 338031). For USA and Canada (oil country tubular goods): (Attn M. Fisher), TI Steel Tube (USA) Inc, PO Box 9911, 14435 East Freeway, Houston, TX 77015 (Tel: 713 455 6937. Telex: 762488).

Tipper Brothers (Tubes) Ltd

Ownership: Ductile Steels Ltd (ultimate holding company Glynwed International PLC).
Works: Rose Street, Bilston, West Midlands. Tel: 0902 43991. Telex: 339066. Managing director: C. A. Willetts. Tube and pipe mills: Two semi-bright mills for electric-weld round, square, rectangular and oval tubes.
Products: Longitudinal-weld tube and pipe – round, square, rectangular and oval.

Tube Investments—see TI Group PLC

Unbrako Steel Co Ltd

Head office: Manor Road, Kiveton Park, Sheffield S31 8PB. **Tel:** 0909 770431. **Telex:** 54176.
Management: N. Vollans (managing director), M. Broomhead (marketing director), J. W. Eyre (manufacturing director), D. Wales (financial director), A. Whitehead

Unbrako Steel Co Ltd (continued)

(engineering director), J. R. Selby (USA), V. B. Harris (USA). **Capital:** £250,000. **No. of employees:** 281 (works); 44 (office). **Ownership:** SPS Technologies Inc, USA.
Annual capacity: Raw steel 30,000 tons; finished steel 28,000 tons.
Works: Kiveton Park (head office). Works director: J. W. Eyre. Steelmaking plant: One 20-ton electric arc furnace (annual capacity 30,000 tons). Rolling mills: One 3-high 28" cogging mill (30,000 tons); one 14-stand 11" rod mill (coil weights 400 or 800kg) (29,000 tons). Other plant: Controlled-atmosphere annealing furnaces, wire-drawing blocks, bar drawing machines (Schumags and bar benches), centreless grinders and peeling machines.
Products: Carbon steel billets and alloy steel billets – 75 to 110mm sq; carbon steel wire rods, high-carbon steel wire rods, and alloy steel wire rods – 10·0 to 26·2mm dia; bright bars and alloy steel bars – 3·2 to 38·1mm; spring steels and bearing steels – billets, rods, wire, bars; bright wire and alloy steel wire – 2·5 to 25·4mm dia; carbon and alloy steel cold-heading wire.

Universal Steel Tube Co Ltd—see English Seamless Tube Co

G. P. Wall Ltd

Head office: Penistone Road North, Sheffield S6 1LL. **Tel:** 0702 348676.
Ownership: Richd W. Carr & Co Ltd.
Products: Hot rolled sheets (carbon and alloy); hot rolled hoop and strip (carbon and alloy); cold rolled hoop and strip; polished, hardened and tempered strip; key steel; piano wire.

Thomas Walmsley & Sons Ltd

Head office: Atlas Forge, Bridgeman Street, Bolton BL3 6RP. **Tel:** 0204 21875.
Works: 14" bar mill.
Products: Rerolled mild steel square bars and flats.
Additional information: The company's activities also include stockholding.

Ward Brothers (Sherburn) Ltd

Head office: Widespan Works, Sherburn, Malton, N. Yorkshire. **Tel:** 0944 70421. **Telex:** 52354. **Cables:** Widespan Malton.
Management: W. Ward (chairman), K. Anderson (managing director), T. M. Paul (sales director), T. Wray (sales manager). **Established:** 1951. **Capital:** £50,000. **No. of employees:** 200. **Ownership:** Private. **Subsidiaries:** None.
Annual capacity: Finished steel 15,000 tons.
Works: Sherburn (head office). Works director: D. A. Ward. Two roll forming lines – one 10-stand for sections and one 24-stand for cladding (annual capacity 15,000 tons).
Products: Cold roll-formed sections.
Brands: Multibeam (cold rolled purlins and rails).

Warner & Co Ltd

Head office: Cargo Fleet, Middlesbrough, Cleveland TS3 6AT. **Tel:** 0642 247628. **Telex:** 58324 brafos g. **Cables:** Refinery Middlesbrough.
Management: P. Clasper (director). **Established:** 1900. **Capital:** £160,000 (issued). **No. of employees:** 45 (works); 18 (office). **Ownership:** Wholly-owned subsidiary of Staveley Industries PLC, London. **Subsidiaries:** None.
Annual capacity: Pig iron 32,000 tons.
Works: Cargo Fleet (head office). Works director: P. Clasper. Two cupolas (annual capacity 32,000 tons).
Products: Steelmaking pig iron, foundry pig iron and special pig irons.
Brands: AMW, CBR, Silver.

Mr. TRAFICANT. OK. And the last question directly then to much of the testimony here discussed in the first panel; do you believe that in the focus that is being now in new American technology initiatives, with the marriage of the Federal Government and the private sector that, No. 1, is there enough money being provided; and No. 2, have we declared enough of an emergency to really go forward and if we have, give us a time table where maybe we can at least stabilize the conditions that exist and start to compete again?

Dr. CANTOR. I am sorry, sir. I have no opinion on certainly the first part of the question, is there enough money. And on the second part I am going to have to beg off. I am not an engineer or a scientist. I am only an economist and I do not know the timetable for development of new technologies and that sort of thing.

Mr. TRAFICANT. Well, we need a few more economists in this steel problem, I assure you, because the situation exists. But I thank you, Doctor, for taking the questions that we have. Thank you, Chairman.

Mr. VOLKMER. Dr. Cantor, I have a few questions and then we will break right at 12:30 for lunch and we will start again right away at 1 p.m.

It appears that the tone of your testimony is a little less harsh than what we have read and heard and sometimes we hear on the floor of the House, other critics of the steel industry. Why do you feel that perhaps some people are very highly critical and then other persons, like yourself, saying that maybe the steel industry is doing some things that they should have been doing, they have already started modernization and they started years ago?

Dr. CANTOR. Many academic economists who look at the steel industry of course look at it from the perspective of conventional economic theory, which talks about the benefits to consumers and so forth. And they are talking about it from a proposition of comparitive advantage. If somebody can produce something less expensively than somebody else, then the former wins. I would not disagree at least in principle with that concept. What I try to do in my research is to take apart whatever data is out there and is available and see where it leads me. Now 2 years ago, again, as I indicated in my oral presentation I believe or in response to an earlier question, when I started looking at the declining capacity in the industry over the 1970's, I found that this was due not to the closing down of new plants, I found this was, at the time at least—sadly we are seeing examples of the closing down of plants today, of new plants—I found that this was simply the elimination of outmoded, inefficient open hearth capacity. And perhaps it is just the way I am looking at this industry.

I would not say that the industry has necessarily done enough to maintain its competitiveness. They did not have to. I said that earlier, again, both in prepared and oral testimony. Today they have to and today they are scrambling to do so. But they have done quite a bit.

That would be the answer to the question.

Mr. VOLKMER. Now as I reviewed the data on what is happening in the American steel industry and the problems, it appears to me that, like you say, that we have had open hearth capacity reduced considerably since 1980 but we still have some, and yet in the same time we have had basic oxygen facilities closed down, which are a lot more competitive than your open hearth. How do you explain that we can still operate, or some companies can still operate open hearth, and other ones close down the basic oxygen? And how long do you estimate we will still have some of these open hearth facilities?

Dr. CANTOR. At least the open hearth facilities that exist in one company in eastern Pennsylvania, I think we will probably see those being closed down at the end of this decade. At least that is what some of the people in that company imply. Imply.

With respect to other closings of more modern plants than the old open hearth, in some instances it is the market for the products that those plants produce. Not too far from here we have the recent announcement by the LTV Corp. of essentially closing down most of the Aliquippa plant. Now that plant produces oil country tubular goods. In response to a request from an office not represented in this room, a few weeks ago, I looked at the market for oil country goods in relation to the American steel industry's capacity to produce those goods. According to the data, if we could keep out every ounce of oil country goods from abroad, our oil country goods industry would still have about 40-percent excess capacity. Given that there will be about 1 million tons, perhaps more or perhaps a little bit less, of oil country goods coming into the United States over the next couple of years, we would have two-thirds of our capacity being excess capacity. I will supply a copy of that memorandum to the committee.

[The material referred to follows:]

Congressional Research Service
The Library of Congress

Washington, D.C. 20540

July 23, 1985

TO : House Committee on Science and Technology
Subcommittee on Investigations and Oversight
Attention: James Paul

FROM : David J. Cantor
Specialist in Industry Economics
Economics Division

SUBJECT : Request for Additional Material for Hearing Record

At the Subcommittee's hearing on "New Technology and the Future of Steel", held in Youngstown, Ohio on July 22, 1985, you requested that I submit for the hearing record a copy of my analysis of the demand for oil country tubular goods in relation to the supply potential of the U.S. industry.

I transmit herewith a copy of my memorandum, dated June 13, 1985, titled: U.S. Capability to Supply Domestic Demand for Oil Country Tubular Goods (OCTG).

Congressional Research Service
The Library of Congress

Washington, D.C. 20540

June 13, 1985

TO :

FROM : David J. Cantor
Specialist in Industry Economics
Economics Division

SUBJECT : U.S. Capability to Supply Domestic Demand for Oil Country Tubular Goods (OCTG)

This memorandum responds to your request for information on the ability of the U.S. steel industry to supply domestic demand for oil country tubular goods (OCTG).

Based on a recently published estimate of U.S. steel industry capability to produce OCTG, it would appear that there is today considerable excess capacity in this segment of the U.S. steel industry. The United States International Trade Commission in its investigation of OCTG imports from Argentina and Spain reported that the U.S. industry had the capacity to produce about 5.1 million tons of OCTG in 1984. 1/ Total demand for American OCTG in 1984 was about 3.8 million tons; the domestic market accounted for more than 3.7 million tons of this total, and exports amounted to about one-half million tons. 2/ For 1985, total demand for American OCTG is projected to be about 3.1 million tons;

1/ U.S. International Trade Commission. Oil Country Tubular Goods From Argentina and Spain. USITC Publication 1694, May 1985. Washington, 1985. p. A-20.

2/ Data Resources, Incorporated. Steel Industry Review. First Quarter 1985. Lexington, 1985. p. III.25.

exports are estimated to be about the same as in 1984, but domestic demand is projected to fall by nearly 1 million tons. 3/ Domestic and foreign demand for U.S. OCTG is expected to be at about the same level in 1986 as in 1985, about 2.9 million tons. Thus, for at least the next two years, the domestic industry could conceivably supply all of U.S. and foreign demand for American OCTG with capacity to spare. With the capability to produce 5.1 million tons of OCTG, and a combined domestic and export demand of about 3 million tons, the U.S. industry would have over 2 million tons of excess capacity, more than 40 percent of its total capacity.

This estimate is relatively optimistic, because it assumes that total U.S. demand for OCTG would be supplied by the domestic industry. Realistically, some portion of the U.S. market would be supplied by imports, such that the extent of excess capacity in the domestic industry would be greater than 40 percent. Data Resources, Incorporated (DRI) projects that U.S. imports of OCTG in 1985 and 1986 would fall in the range of 1.2 to 1.4 million tons. 4/ We would note that the DRI estimates take account of the efforts of the Administration to limit imports of all steel products. 5/ If DRI's estimates of both demand for and imports of OCTG turn out to be correct, then, with 5.1 million tons of capacity, nearly two-thirds of the U.S. industry's OCTG production capability would be unutilized.

3/ Ibid.

4/ Ibid.

5/ To achieve import restraint, the Administration has negotiated voluntary export restraint agreements (VERs) with several steel-exporting countries. While details of all of the agreements have not been made public, we note that the VER with Japan allows Japan a 17.56 percent share of the U.S. market for OCTG. Similarly, Spain, Brazil, and Mexico have negotiated a market share of about 4.2 percent of the U.S. market for OCTG. American Metal Market, March 19, 1985 and April 12, 1985.

While it appears that the OCTG segment of the steel industry has considerably more capacity than it is likely to need in the next few years, you should keep in mind at least two factors that could alter this conclusion. First, as with all projections of future events, the estimates of the size of the market for OCTG could change. Second, and perhaps more important, there is no certainty that the estimated capacity of the industry would remain intact. The stagnant demand for oil country goods in the past few years, the aging capacity currently in place, and the poor financial state of the steel industry generally has led to the closing down of much OCTG capability in recent years. If further closures occur for these or other reasons, it is conceivable that there could be a shortage of capacity rather than an excess.

I trust that this information is responsive to your request. If you have further questions, please call me at 287-7740.

Mr. VOLKMER. Yes; I would like to have that. In other words, we have the steel mills that are basically orientated toward different products and those products may not be any longer competitive. That gets me to our demand. That gets me to the question that I would like to ask and have you just talk a little bit more about. And that is the question of steel intensity and what is the projections for the future in relation to where it has been in the past in this country.

Dr. CANTOR. During the 1970's plastics and aluminum made substantial inroads into the steel market. This is why I characterized in my prepared statement the problem in the steel industry is one of adjusting to competition. Not adjusting to competition from overseas but also from domestic products.

Mr. VOLKMER. In other words, imports is not the whole problem.

Dr. CANTOR. Not the whole problem. Plastics, aluminum, other materials of that sort. Ceramics which is likely to emerge in the next few years.

During the 1970's aluminum made substantial impact. According to a Chrysler engineer a couple of years ago, aluminum products have bottomed out as far as a competitor of steel, at least in the automotive market.

Plastics, that same engineer 2 years ago stated, would still make inroads. That was confirmed or reinforced, if you will, by this week's Business Week magazine which talks about additional inroads into the automotive market, one of the major markets, two or three major markets for the steel industry.

A year ago or so I took a look at the steel intensity question, by which I mean the ratio of steel usage per dollar of GNP. During the 1970's it fell by 22 percent. During the 1970's, from 1975 on to about 1983, 1984, it fell by about 22 percent. Today it seems to be leveling off. We are still using less steel per dollar of GNP than we did 10 years ago. But there is some reason to at least be hopeful that it will not decline any further.

Mr. VOLKMER. But if the plastics manufacturers, along with the automobile manufacturers, would decide that it would be cheaper to make the bodies, and for some reason or another, out of plastics, such as a Corvette is being done, that would have a severe impact on the steel industry, would it not?

Dr. CANTOR. It certainly would. And the industry has to aggressively develop products and ways of producing those products that will compete with that. And that will forestall that.

Mr. VOLKMER. Now, in the event that the steel industry looked better to the financial markets, or if the Congress somehow would provide a method whereby they could obtain funds at lower interest rates, where do you anticipate that the steel industry would use those funds?

Dr. CANTOR. The major impact of lower interest rates would be in the relatively most capital intensive parts of the steel—the steel product production process. That would be at the front end. Blast furnace, or perhaps if not the conventional blast furnace, the KR process that Mr. Robins referred to earlier; and in the steelmaking furnace itself. Also in the continuous casting investment. Those are the most capital intensive. So that the interest rate will have a greater impact there.

This is all relative, of course. This is not to say that the rolling mills, the product rolling mills capital is not extremely important. But labor becomes more important as an input at that stage.

Mr. VOLKMER. I do not know if you are inclined to or prepared to answer the following question or not, just say so. I just recently read where our imports of steel, even under the Steel Import Stabilization Act, are still above the 20 percent or 18 percent that the Congress last year proposed. It is somewhere around 24 or 26 percent. Is that correct as far as you know?

Dr. CANTOR. At the beginning of this year, through March, it was about 25 percent. It is coming down. Data Resources, Inc., estimates for 1985 a market share for imports of about 23 percent, which would be roughly 3 percentage points higher than what Congress indicated as an upper limit target for steel imports.

Mr. VOLKMER. But it will be declining then over the next——

Dr. CANTOR. Over the next few years it will be down in the range of about 21 percent; yes.

Mr. VOLKMER. I have no further questions. Gentlemen?

Mr. TRAFICANT. Yes; one other question, briefly.

As far as the Congressional Research Service is concerned, what particular types of recommendations might you have that would help this industry relative to the current administration's position on what would appear to be any protectionist measure the Congress might institute; how do you foresee, with imports ravishing our industrial base as they have, how are we really going to, in at least a temporary period, wean ourselves from that and give us back competitive edge? Have you conducted any types of studies or is the Congressional Research Service, even if it is not just directed to the steel industry but to the trade situation in general, have you performed any such studies and do you have any recommendations or anything you could impart with us here today or provide to us in written form in the future?

Dr. CANTOR. We don't have any recommendations for what should be done. Clearly there are obvious things, and I have mentioned a few of them or indeed inferred or implied a few of them. And you have heard these from everybody else. The general macroeconomic questions; the interest rate. I recently did a report showing how lowering of the interest rate could affect steel costs. Because that is the real question here. That is how to get back at these imports, if that is the problem; or to get back at plastics or aluminum, if that is the problem.

Lowering the interest rate by 3½ points could reduce cost of production, just on interest charges alone, by $14.

Mr. PACKARD. That is per ton?

Dr. CANTOR. Per ton.

Mr. PACKARD. Per ton.

Dr. CANTOR. When you add to that the benefits of the technology that that borrowing would be used to purchase, that same continuous caster, you're talking another $35 a ton. If we are to do as Mr. Robins suggested, namely, install more continuous casters in places where they do not exist today, if we could get the interest rate down 3½ points, however it is to be done, you are talking $50 a ton. And that would surely, one, increase the cash flow of these companies and thus give them more opportunity to internally generate funds for reinvestment in compliance with the law; two, it may in fact bring down the price and the cost of production so that the steel companies could come very close to, if not meet, foreign competition head on as far as price is concerned.

Macroeconomic changes, policies that conceivably could effect the exchange rate. Nobody is denying that the high value of the dollar today makes, one, it difficult for the steel industry in this country or anybody else to export overseas; and second, it makes foreign goods very attractive to ourselves.

Mr. VOLKMER. Could the gentleman yield just on that for just a moment?

Mr. TRAFICANT. Go ahead.

Mr. VOLKMER. If we had a policy then, as we do in certain other areas, to permit the steel companies to borrow at the rate that the Government borrows from, plus maybe a half a percent for handling, and then required it to be used for certain modernization efforts, this would be very beneficial as far as them being able to help finance it at the present time, would it not?

Dr. CANTOR. That certainly is an option.

Mr. VOLKMER. It is an option, right.

Dr. CANTOR. But I believe in the recent times, in recent history that that was used, what we read about there, the work force going on strike yesterday.

Mr. VOLKMER. Yes. I know. It did not maybe help enough. I don't know.

Mr. TRAFICANT. Would the chairman yield? We have talked about the overinflated dollar and all the macroeconomic conditions that exist and we have an awful lot of studies on hold, but even in spite of all those advantages the foreign producers have, they still subsidize their industry in addition to these economic advantages that we have through our trade situation that currently exists.

Even though you do not make these recommendations, do not you think it is about time that we start to become a little bit fairer with our own producers so that they can compete and then we do have an industry where we have subsidies, special types of incentives and accelerated capital investment attractions for them and magnets for them so they can dump over here and take our jobs and take our trade; do not you think maybe it is time that we should be implementing some sort of stopgap measures to prevent that before we lose and erode all of our industry base, not just the—but certainly steel is perhaps the microcosm of the situation that exists?

Dr. CANTOR. Again, sir, forgive me for, if you will, weasel-wording with you. I do not like to. But as you know we do not, at CRS, make recommendations.

Mr. TRAFICANT. I know that. But I was not asking you from your position. I was asking you from your economist position.

Mr. VOLKMER. We will have to recess. We are past 12:30. We are going to recess the hearing now until 1 p.m. At that time we will have Dr. John Roblin.

AFTERNOON SESSION

Mr. VOLKMER. We will resume our session.

Our next witness is Dr. J.M. Roblin, the director of strategic planning for LTV Steel. We have asked him to attend today to discuss how a representative steel company makes decisions. Carrying out research will be no help to the steel industry if it cannot make use of the results of that research. We hope to learn from his testimony the things that are important to a company when it makes its decisions where to invest its money.

Dr. Roblin, your prepared statement, attachments and exhibits will all be included in the hearing record in their entirety. And you may proceed at this time.

STATEMENT OF DR. JOHN M. ROBLIN, DIRECTOR OF STRATEGIC PLANNING, LTV STEEL CORP., CLEVELAND, OH

Dr. Roblin. OK, thank you. My name is J.M. Roblin and, as you say, I am director of strategic planning for LTV Steel Corp. And on behalf of the company I am pleased to cooperate with your subcommittee and testify to, first of all, the procedures used by our company to set corporate strategic priorities for investing in facilities and in research and development and in new technologies; and second, on LTV's activities related to the requirements of the Steel Import Stabilization Act with respect to facilities modernization and retraining.

My more detailed written testimony has been submitted. I will take a few minutes to summarize that testimony for you if I may and then answer your questions after that.

As you know, LTV Steel Corp. was created about a year ago by the merger of J&L and Republic Steel, and as it has recently been reorganized it consists of three separate companies, each supplying a different line of steel products.

David Hoag, who is our chief executive officer, is responsible for the overall strategic direction and objectives. And he ensures that the subsidiary companies' strategic plans are consistent with overall corporate policy, with overall corporate strategic plans and directors.

But within this framework each of the LTV Steel Co. presidents is responsible for developing and approving appropriate strategies for operating each of his businesses so that they are operated at their fullest potential of profitability and also they are responsible for initiating the programs to implement those strategies and to achieve the desired objectives.

As strategic planning director, my responsibilities include, first, developing strategic management processes which best serve the requirements of each of those companies; and second, coordinating these strategic planning processes among the companies and then working with Mr. Hoag, and with our corporate planning department in the parent LTV company in Dallas, to ensure that the whole strategic planning process, and those in the various organizations, are consistent with one another and they complement one another.

Now, as we develop our strategic plans we first define our company's business and its mission. And LTV Steel's business of course is to supply steel products, primarily to domestic American manufacturers that serve the consumer and capital goods markets. And our mission might be described as doing this in a way which achieves five strategic objectives.

First, to excel at meeting our customers' needs by supplying products of uniformly superior and ever-improving quality; and by achieving for all of our products a superior level of customer service and delivery reliability;

Second, to provide an environment which allows each individual employee throughout the company to rise to the level of his or her ability and effort;

Third, to generate cash to meet the capital expenditures, debt requirements, and dividend requirements [1] by supplying those products we make at a profit;

Fourth, to increase the value of our shareholders' investments; and

Fifth, throughout all of this to adhere to the highest standards of conduct, complying fairly with the expectations of our customers, employees, our shareholders, our governments, and the plant communities in which we do business.

So these five objectives represent the basis by which we conduct our business and the basis on which we make our decisions. Our company presidents and their organizations try to make their decisions, especially investment decisions, so as to achieve these five strategic objectives.

Now as far as priorities are concerned, these company presidents try to give highest priority to those investments which do the most to meet our customers' needs. We believe that if we serve our customers' needs better than other suppliers do, then in general we will achieve the other objectives.

But many times, either the particular characteristics of the investment or some aspect of the general business environment prevents us from giving the customers' needs the high priority that would otherwise be assigned.

So you might say the answer to your question is, there is a double answer, depending on what time frame of reference you are talking about. Because today is one of those times when we have had to override our normal priorities.

Today, because of the continuing inability of our industry to generate adequate financial returns, we have had to favor short-term financial considerations and relatively risk-free investments. In recent years, no matter what actions our industry has taken, including substantial improvements in productivity and in total cost, we have still not been able to achieve the third and fourth strategic objectives that I mentioned. Namely, we have not been able to generate the cash needed for our dividends, debt, and capital requirements, and we have decreased the value of our shareholders' investments rather than increasing it as we need to do.

So for this reason our priorities today are slanted toward achieving early improvement in financial performance, even at the expense of long-term performance. But if we do not survive today, there will not be any tomorrow to worry about. So this reprioritization is very natural and very necessary. We have simply got to restore profitability to this vital industry and we have got to do it soon.

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[1] See app. A.

To understand a little bit better how we set priorities, I think you have to appreciate and understand the American steel industry's troubles. You are all familiar with the continuing financial losses which now amount to billions of dollars. Hundreds of thousands of jobs that have been lost; millions of tons of productive steel capability that has been closed and written off; and employees, stockholders, vendors in many American communities like those in this area that do business with the American steel industry have undergone uncounted economic suffering.

Now in reality our industry, our domestic steel industry, has been in a liquidation mode for the last 30 years. This is an ongoing process, not one that started just recently. And it is driven by the competitive disadvantages of aging facilities and high cost operations. But it has been brought to its present state by illegal imports and declining demand.

These competitive disadvantages lead to reduced demand for our products and lowered profits from our operations. And because of the reduced demand and the lower profits, the internal cash flow that would otherwise be reinvested to modernize the facilities is reduced. But they also make reinvestment less attractive to outside investors, as was alluded to earlier here, because the meager profits simply are not attractive enough to repay the investors in a reasonable time. Also, borrowing for investment in new facilities becomes more difficult, more expensive, because lenders perceive lending to a poorly performing company, understandably, as high risk.

But the net effort of all of these is to dry up the sources of capital that are needed for modernization. Without capital, the competitive advantages or [1] disadvantages that started the whole process are merely reinforced and the process continues, feeding on itself until, if it is not reversed, individual plants and entire companies and eventually a whole industry is liquidated.

In the case of the steel industry, the process was hastened by two factors. First, a steady decrease in demand for steel products, especially for bar and tubular products; and second, by an unprecedented increase in imports of steel products and products made from steel. And as you know, many of these are sold at prices below their costs of production and in violation of our trade laws.

I have detailed in the written testimony that steel demand, expressed as steel intensity or the total amount of steel consumed by our economy per unit of industrial activity—and some people do it per unit of GNP, but we do it by unit of industrial activity—has decreased rather steadily, as Dr. Cantor said, since 1972 at an average rate of 3.7 percent per year.

Now the causes of this decline, in addition to substitute products, I think are four.

First of all, a maturing economy in which our capital infrastructure, that is our factories, cities, roads, and so forth, are largely already in place and do not require steel to be built;

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[1] See app. A.

Second, miniaturization and other downsizing, by which the society seeks to conserve energy or other resources. Automotive downsizing is one example;

Third, redistribution of capital spending to less steel-intensive equipment, such as computers, electronics; and

Fourth, indirect steel trade or imports of such things as finished cars, trucks, parts, machinery, other finished goods.

It is estimated, incidently, that these downstream imports today have eliminated the need for about 6 million tons of domestically produced steel every year.

There is no indication that I am aware of that any of these major factors is going to change appreciably in the near future, although a weakening dollar could, in time, lessen indirect steel imports somewhat. But if they do not change, we can expect steel intensity to decrease further. And if so, even with a healthy, steady 3-percent growth in GNP, steel demand is not going to increase appreciably.

At the same time that demand has been falling, imports of steel into this country, aided by illegal dumping and by unfair subsidies, have risen sharply from a level of 12 to 15 million tons in the early 1970's to 26 million tons in 1984, essentially doubling in that 12-year period.

As a result, the volume of steel shipped by the domestic steel industry has fallen drastically. And this shrinkage can be expected to go on as well, until the industry is once again able to rebuild the competitive advantages that once upon a time it held. President Reagan's export restraint program was intended to provide temporary relief by limiting steel imports so as to restore some measure of profitability to the industry. The resulting profits in turn would be reinvested to modernize and regain those competitive advantages that we have talked about. The original target was to limit imports of finished products to 18.5 percent of apparent domestic demand, and keep total imports, including semifinished products at less than 20.5 percent of demand.

Unfortunately, although it is almost a year since the program was initiated, there is no evidence that the program is going to achieve its original target and there is very little evidence that the program is really producing any import restraint at all. Imports through May total 10.6 million tons, which is over 26 percent of consumption. And even though May's level of 1.96 million tons represents a decrease from April and represents a decrease from the monthly year-to-date averages, May's imports still represent 23.4 percent of our demand, far above the original targets. To meet the original target is going to really require vigorous and effective enforcement of the restraint agreements that are so far signed, plus negotiation of additional agreements with countries who have not yet signed.

Despite this, our industry has made important and substantial strides in modernizing to restore competitive advantages. Nearly $12 billion has been spent by the industry in the last 6 years on steelmaking facilities. As a result of that and other efforts, manhours per ton has improved by 26 percent between 1981 and 1984.

LTV, too, has invested heavily, with the two newest casters in the industry now on stream at Cleveland and Indiana Harbor.

Even though our steel losses continue, we in LTV are spending in 1985 over $100 million to modernize our facilities. That is probably about one-fifth of what it really takes to assure viability for a steel company the size of LTV, but it is still a significant sum considering our financial plight. Along with this, we, in February, entered into a partnership arrangement with Sumitomo Metal Industries, Ltd., to build an electrogalvanizing line which will produce one-sided, two-sided and differentially coated, electrolytically galvanized flat-rolled steel for the U.S. automotive industry. This is a world-class facility and it is a dramatic bricks-and-mortar demonstration of LTV's commitment to modernize facilities, modernize products and modernize the skills of our employees.

Because, by itself, investing in facilities, investing in R&D, investing in new technology is not enough. As we modernize to improve productivity workers are displaced; and as we rationalize to balance our supply capabilities with demand, more workers are displaced. So to meet our second strategic objective, that is, providing a meaningful work environment, we have to invest to retrain both our active and our displaced work forces.

LTV's retraining experience at the Campbell Works was an early example of a retraining program for our active work force. We built on that early experience and now conduct similar programs at most new facilities. These training programs include classroom work as well as trips to Germany and Japan for hands-on experience in operating the new equipment. An expensive type of retraining, but we feel—we know, in fact—that it pays off in superior performance and in enthusiasm that allows the new equipment to operate successfully from day 1—because we get a good bit of the learning curve behind us before the equipment ever starts up.

At the new $125 million electrogalvanizing line now under construction in Cleveland, the work force will be hired in the next several weeks. And although production is not scheduled to begin until April 1986, these workers will participate between now and then in training, which will include travel to Japan to get a first-hand opportunity to operate similar equipment.

In every instance where we have retrained the work force for new capital projects, we have worked closely with the State governments. And the result has been competitive operations and enhanced employment security for everyone involved.

But our retraining efforts go beyond these specific projects where new facilities are involved. For example, the quality of all the products from our existing facilities is being upgraded by using what is commonly referred to as statistical process control, or we call it at LTV, integrated process control. This is an exhaustive effort involving countless thousands of hours in training and in developing standards. But today more than 60 percent of our operations have been covered.

We have also developed jointly with the United Steelworkers a labor-management participation team process by which we seek solutions to our shop floor problems. Each of our four plants in the Youngstown/Warren area, on their own initiative, has voluntarily installed this process and joint labor-management cooperative projects are also in place at nine other plants across our company. This is all part of our effort to achieve that second strategic objective and to create a positive work environment, where people can rise to the level of their abilities and efforts. These efforts cannot be substituted for investment in new technology, nor can they save a failing steel plant. But they are one of the tools in a portfolio that we need to regain our competitive advantage. And as well, they upgrade our workers' skills.

Our management has also taken a leadership role in industry efforts to determine ways for management, labor and Government to work together to support our domestic steel industry. And we fully support the recommendations of the Tripartite Steel Advisory Subcommittee on employment, productivity and adjustments.

My written testimony includes those recommendations and also some news articles that report on the findings and recommendations.

While retraining the active work force to operate both our old and our new plants at top efficiency, LTV has worked hard to research, explore and implement efforts to assist those who are unemployed either by modernization or by the eroding demand for our products. Back as early as 1980 when the obsolete open hearth operations at Brier Hill were phased out, we pioneered a private job search assistance and placement effort for our employees. At that time, private assistance to bargained—for steelworkers was unheard of. But we simply used the knowledge and techniques previously used only for managers and executives and it worked and it made a big difference for 1,200 people affected by that plant closing.

LTV Steel purchased the closed Crucible steelmaking operations in Midland, PA, and modernized the primary operations for our growing specialty steel business. This opportunity for modernization came at a cost to our Warren, MI, plant where outdated and obsolete electric furnaces were replaced by Midland's new modern furnaces and continuous caster. But in Warren, again that is Warren, MI, rather than Ohio, in March 1983 we again offered private job search assistance to those affected by obsolesence. Then, building on the knowledge gained at Brier Hill and at the Warren, MI, plant we mounted a joint effort with the United Steelworkers of America to deal with what was up to that time our biggest challenge; namely, the permanent displacement of 4,000 employees by their former employer. We established a joint company/union community training committee and set up private funding under the terms of the collective bargaining agreement. This provided a 75-cents-per-hour—worked contribution to the joint committee's training trust fund. And we also set aside another 25 cents for each hour worked as a contribution to a community food bank. And that continues in operation today.

With those funds the joint committee commissioned a study by the Center for Labor Studies at Carnegie Mellon to research the affected population and to recommend an appropriate response. And the text of that study, along with its recommendations, are also included with my written testimony.

This program has been cited as a model of what can be accomplished in a restructuring industry when labor, management, and governments cooperate.

The seed money provided through the bargaining agreement attracted additional funds so that this project now covers people affected in the States of Ohio, Pennsylvania, and West Virginia. And in addition to funding provided under the labor agreement, the project has received Job Training Partnership Act [JTPA] funding totaling $2.2 million. The project provides a broad range of services for the dislocated steelworker, including basic job finding information, secretarial, and word processing services, long distance telephone lines, counseling services, workshops to individuals on a variety of assistance programs.

Beyond that, the Midland Center for Career Development serves as a catalyst supporting various economic development organizations throughout the region as they try to find new directions for the community. So far this retraining venture has made a difference for 354 displaced steelworkers who found new jobs; another 133 who have received skills training and another 161 who have upgraded their skills in basic reading and mathematics.

The success of the activities at Midland has encouraged us to begin the development of our latest effort at the Aliquippa Works. When Aliquippa was idled, we already had an extensive retraining effort underway to upgrade our craft workers. But to deal with the effects of idling, we have created a Center for Career Development similar to that in Midland, utilizing a mix of private, State and Federal monies. And we are now in the process of applying for funding under JTPA and other programs as well.

So using the knowledge gained in Youngstown; Warren, MI; and Midland, and with the support of the Government, along with contributions from labor and management, we hope to assist our employees to make the very difficult transitions that need to be made as our industry restructures in order to compete effectively in what have become world markets for steel.

That finishes my verbal testimony. And I will be glad to answer whatever questions you have. Or try to anyway.

[The prepared statement of Mr. Roblin and attachments follow:]

DRAFT #1 (7/19)

Testimony before the House of Representatives Subcommittee on Investigations and Oversight: Committee on Science and Technology

J. M. Roblin

Director of Strategic Planning

LTV Steel Corporation

This document was prepared in response to this subcommittee's request for descriptions of:

- LTV Steel's method of setting corporate priorities for investment in facilities, in research and development, and in new technologies and
- LTV Steel's activities related to the requirements of the Steel Import Stabilization Act with respect to facilities modernization and worker retraining.

LTV Steel Corporation

LTV Steel Company was formed on July 1, 1984 from the merger of The LTV Corporation and Republic Steel ("Republic"). After the merger, Republic's steel facilities were combined with Jones & Laughlin Steel Incorporated ("J&L Steel") and LTV Steel Company, Inc. ("LTV Steel") is owned by the LTV Corporation.

The Summary of the Proposed Merger of the Joint Proxy Statement issued for the Annual Meeting of Stockholders of The LTV Corporation and the Special Meeting of Stockholders of Republic, for purposes of voting on the merger sets forth the reasons for the merger:

"In the opinion of the managements of LTV and Republic, the Merger presents the opportunity to bring under common control the steel operations of J&L Steel and Republic, both of which have experienced substantial losses in recent periods, to form a more efficient steel operation better able to compete with foreign and domestic producers in today's very competitive world steel market. The primary business reasons for the Merger relate to certain economies of operation which are expected to result from the complementary nature of the steel and related raw material operations of J&L Steel and Republic. In addition, while no assurance can be given, the managements of LTV and Republic believe that the combination will result in important efficiencies through higher productivity, improved operating cash flow and lower capital expenditure requirements."

In addition to the cost benefits resulting from the merger, the LTV Corporation announced on May 17, 1985 a three point program to strengthen and make more competitive the steel operations of LTV Steel. The three point program consists of (i) the reorganization of LTV Steel into three new, stand-alone companies designed to make the steel operations more efficient and competitive, (ii) indefinite idling of the primary operations at the Aliquippa Works and (iii) an unrelenting attack on costs in addition to the cost cutting which has already occurred. A copy of Mr. Raymond A. Hay's speech announcing this three point program is attached.

LTV Steel also reported in its 10-K filed with the Securities and Exchange Commission ("SEC") for the fiscal year 1984 that it has also "taken a number of steps to reduce costs, conserve cash and increase productivity... These efforts have been concentrated primarily in the areas of capital spending avoidance, inventory level reductions, salary and work force reductions and optimization of the most efficient facilities." See SEC Form 10-K which is attached.

As recently reorganized, LTV Steel consists of three companies each supplying a different line of steel products. These three companies are the LTV Steel Flat Rolled and Bar Company, the LTV Steel Tubular Products Company and the LTV Steel Specialty Products Company, which produces and markets stainless steel products.

Setting Priorities for Investment in Facilities, Research and Development and New Technologies

Strategic Planning

Overall strategic direction and objectives for these three companies are the responsibility of David H. Hoag, who is the chief executive officer of the LTV Steel Companies. Mr. Hoag also ensures that the subsidiary companies' strategic plans are consistent with overall corporate strategic plans and directions.

Within this framework, each of the LTV Steel company presidents is responsible for developing and approving appropriate strategies for operating his business at its fullest potential of profitability and for initiating programs to implement the strategies and achieve the desired results and objectives.

My responsibilities as Strategic Planning Director include

- developing strategic management processes which best serve the requirements of each individual steel company,
- coordinating the strategic planning processes among these companies, and
- working with the chief executive officer and with the Corporate Planning Department of our parent LTV Corporation to ensure that strategic planning processes in the various organizations and sub-organizations are consistent with each other and complement one another.

Although techniques and nomenclature may vary from company to company, the overall approach to strategic planning across the industry is probably very similar to LTV Steel's approach.

Our company first defines its business and its mission. In the case of LTV Steel, our business is to supply steel products primarily to domestic American manufacturers which serve the consumer and capital goods markets, and our mission might be described as doing this in a way which:

- excels at meeting our customers' needs by
  - supplying products of uniformly superior and ever improving quality and
  - achieving for all our products a superior level of customer service and delivery reliability

- provides an environment which allows each individual employee to rise to the level of his or her ability and effort
- generates cash to meet the capital expenditure, debt repayment and LTV dividend requirements by supplying these products at a profit
- increases the value of our shareholders' investment
- and adheres to the highest standards of conduct, complying fairly with the expectations of our customers, employees, shareholders, governments, and plant communities.

These five objectives represent the basis by which we conduct our business and LTV Steel attempts to run the business so that every decision that's made ultimately contributes to the achievement of these five strategic objectives.

Investment Priorities

There are many strategies, plans and programs that are needed to achieve these objectives and these generally are implemented by each of the company Presidents and their organizations. Because of the proprietary nature of these strategies, this document deals only with how our companies set priorities and develope these strategies and not with the strategies themselves. In the final analysis, decisions, especially investment decisions, are made based on their effects on the five objectives outlined above. In general, we try to develop, maintain and effectively utilize competitive advantages. To us, that's what strategy is. For every investment decision, we expect our company Presidents to answer the following questions:

- What will be the effects of the decision on our customers and on our ability to excel in meeting their needs?
- What will be the effects on our employees and on our ability to provide them secure and meaningful employment?
- What will be the effects on our ability to generate the cash required to maintain our business?
- What will be the effects on the value of our shareholders' investments?
- Is the decision consistent with LTV Steel's high standards of conduct?

In general, our company Presidents try to give highest priority in their decision-making to the the first strategic objective, namely the effect on satisfying the customers' needs. We believe that if we serve our customers' needs better than other suppliers do, then in general, the other objectives will also be achieved.

But many times, either the particular characteristics of the investment or some aspect of the general business environment precludes giving the customers' needs the high priority that would otherwise be assigned.

Today is one of those times. Today, because of the continuing inability of our industry to generate adequate financial returns, we have been forced to give highest priority in our decision-making to financial considerations. In recent years, no matter what actions we have taken, we have not been able to achieve our third and fourth strategic objectives. That is, we have neither the generated cash needed to meet our dividend, debt and capital needs, nor have we increased the value of our shareholders' investments. And no industry or company can survive unless it can meet these objectives.

To understand how we set priorities, one has to understand and appreciate the magnitude of this industry's troubles are well documented and need not be detailed here. The continuing financial losses of billions of dollars, hundreds of thousands of lost jobs, millions of tons of steel productive capability that has been closed and written off and untold economic suffering that has been inflicted on the employees, stockholders, vendors and the many American communities that do business with the American steel industry are well known and amply documented.

The domestic steel industry has been in a liquidation mode for the last thirty years. This process is shown schematically in Exhibit 1. It's an ongoing process driven by the competitive disadvantages of aging facilities and high cost operations. These competitive disadvantages lead to reduced demand for the product and lowered profits. Reduced demand and lowered profits in turn not only decrease the internal cash flow that would otherwise be reinvested to modernize the facilities. They also make reinvestment unattractive to outside investors because earnings are insufficient to repay the investors in a reasonable time. And further, borrowing for reinvestment becomes more expensive because lenders perceive such lending as high risk and therefore command higher interest rates. The net effect of all these is to dry up the sources of capital needed for modernization and development, and this accentuates the competitive disadvantages that started the process.

In the case of steel, this process was hastened by a steady decrease in demand for steel products, especially for bar and tubular products and by an unprecedented increase in imports of steel products and products made from steel, many of which come in at prices lower than their production costs, in violation of our trade laws.

As Exhibit 2 shows, steel demand expressed as steel intensity or the amount of steel consumed by our economy per unit of industrial activity has decreased rather steadily since 1972 at an average rate of 3.7% per year. The causes of this decline are:

- a maturing economy in which our capital infrastructure, i.e. factories, cities, roads, utilities are largely in place. Maintenance of the infrastructure requires much less steel than the original construction.
- miniaturization and other downsizing by which our society seeks to conserve energy and other resources. Automotive downsizing is only one example.

- redistribution of capital spending. Exhibit 3 shows that spending for both non-residential and for commercial/industrial construction has increased since 1979 but less of that spending is for the steel-intensive mobile and stationary equipment and more is for electronics (Exhibit 4). In 1983, over half of the total spending for producers' durable equipment was for electronics, compared to less than 20% in 1965 (Exhibit 5).
- Indirect steel trade or imports
  - Exhibit 6 shows importation of cars, trucks and parts increasing and now amounting to 4.5 million tons of steel
  - Exhibit 7 shows the U.S. in 1984 to be a net importer of machinery for the first time in history, whereas as recently as 1980 the U.S. was a net exporter of about 3 million tons of steel as machinery products.
  - Exhibit 8 shows imports into the key markets for steel hot rolled bars increasing dramatically from 1972 to 1983
  - Exhibit 9 shows total indirect steel importation at about 6 million tons and still increasing. That this trend will probably continue was confirmed recently by a pilot study undertaken by LTV Steel. In that study, a number of LTV Steel's major customers for hot rolled bars reported that

- -- importation has had substantial adverse effects on their businesses, causing them to increase their own importation to keep their costs in line with competition, both domestic and foreign.
- -- importation runs the gamut from raw materials to finished products
- -- disadvantages of importation, including logistics problems, long supply lines, larger inventories, communications problems, and risks of various offshore instabilities such as changing monetary or other government policies are generally outweighed by cost savings.

There is no indication of any major changes in these trends, although a weakening dollar should in time lessen indirect steel imports. As a result, we can expect steel intensity to decrease further, so that even with a healthy steady 3% growth in GNP, steel demand will not increase appreciably.

Steel Imports

During this same time imports of steel into this country have risen sharply aided by illegal dumping and unfair subsidization. Exhibit 10 shows that import tonnage has risen from a level of 12-15 million tons in the early seventies to 26 million in 1984, essentially doubling in that 12-year period. And as indicated in Figure 11, imports as a percentage of this country's steel demand last year and again this year are about 27%. This has resulted in drastic shrinkage in the volume of steel shipped by the domestic steel industry, as shown in Exhibit 12. This shrinkage will continue until our industry is able to rebuild the competitive advantages it once held. President Reagan's program of export restraint agreements, supplemented by the Steel Import Stabilization Act was intended to provide temporary relief by limiting steel imports so as to restore to the industry some measure of profitability which would allow reinvestment for modernization. The original target was to limit imports of finished products to 18.5% of apparent domestic demand, and keep total imports, including semi-finished products at less than 20.5% of demand.

Unfortunately, although it is almost a year since passage of the Act, there is no evidence to suggest that the Act will achieve its original target and indeed there is little evidence to suggest that the Act is resulting in any import restraint at all. Imports through May total 10.6 million tons or over 26% of consumption. Although May's level of 1.961 million tons represents a decrease from April and from the monthly year-to-date average, May's imports represented 23.4% of demand--far above the original target. To meet the original target will require vigorous and effective enforcement of the restraint agreements signed to date and negotiation of additional agreements with countries not yet signed.

In summary, it is obvious that this liquidation process has fundamental strategic implications for the steel companies. It limits the alternatives available to us; it influences the priorities we assign to various actions; it predominates our thinking on any decision we make; and in many cases, it dictates the decision itself. Its main result has been to shift our priorities to investments which will effect early improvement in financial performance. And since resources, especially capital resources, are limited, this shift has been at the expense of projects that favor long term improvement anddevelopment. We tend to favor these quick payback projects even though the total benefit may be less than alternative slower payback projects. This slows the necessary process of restoring our competitive advantage.

It should be pointed out, however, that despite these severe financial constraints, our company and our industry have made important and substantial strides in restoring competitive advantages. In the last six years, the industry has spent nearly 12 billion dollars on steelmaking facilities--an amount that far exceeded the cash from operations. Costs have been reduced and efficiency and productivity improved. From 1981 to 1984, manhours per ton of steel shipped were reduced 26%. This gain exceeded gains in Japan, West Germany, France and the United Kingdom.

In the United States last year, manhours per ton were six. This is below the figure in each of the countries I just mentioned including Japan.

Progress is being made. At my own company since 1981, the manhours per ton of steel shipped has been cut 21%. This has been accomplished through remanning agreements with hourly workers, salaried force reductions, merger benefits and participative employee involvement programs.

When capital has been available, continuous casting, computer controls, ladle metallurgy stations and other improvements have been installed.

The domestic industry as a whole has been streamlining its management structures and has lowered the average number of salaried employees per net ton of steel shipped by nearly 20% over the last few years.

Major decentralization moves are underway to create more tightly run companies with hands-on management to improve efficiency and response to customer needs in a rapidly changing environment.

Even though LTV Steel's cash flow has been negative since passage of the Import Stabilization Act, LTV intends to spend in 1985 over 100 million dollars to modernize its facilities. Additionally, LTV in February entered into a partnership arrangement with Sumitomo Metals Industries, Ltd. to build an electrogalvanizing line and produce one-sided, two-sided and differentially coated electrolytically galvanized flat-rolled steel for the U.S. automotive industry. This world-class facility is a dramatic bricks and mortar demonstration of LTV's commitment to modernize facilities, products and the skills of our employees.

Two factors are worth noting in this connection:

1. The $100 million capital spending limitation imposed by today's financial constraints is too little to even maintain, much less modernize a steel company of LTV Steel's size. Some estimates are that $500 million annually would be needed to assure long term viability
2. These modernization efforts are motivated primarily by our intent to achieve the five objectives previously listed rather than only by the need to comply with the Import Stabilization Act's provision to reinvest cash flow in modernization and retraining.

RETRAINING OF THE WORKFORCE IN RESPONSE TO MODERNIZATION AND RATIONALIZATION

Retraining of the Active Workforce

For LTV Steel Company, the Campbell Seamless Tube Mill best exemplifies our dilemma involving capital investment for modernization. Our $65 million investment for modernization of plant and equipment and thousands of hours spent on retraining the workforce to develop a world-class operation have not been sufficient to allow us to sustain operations on a regular basis while this country continues to be flooded with unfairly subsidized tubular products. Our retraining experience with the Campbell workforce has been a positive and enlightening experience, and in recent years has been repeated in each location where we have brought on line new continuous casters in Cleveland, Indiana Harbor and Aliquippa as well as in the construction of our new Electro-Galvanizing facility in Cleveland. Significant expenditures have been made to each of these projects in fully developing the capabilities of the workforce to maximize the utilization of "high technology" equipment by steelworkers skilled in the knowledge of equipment, product and quality. Operating crews from the Campbell Seamless Mill traveled to Japan to obtain "hands on" experience in operation of the new equipment and crews from our Aliquippa Works traveled to Germany to observe and operate their new casters before start up. It was a few short years ago when only engineers and managers made these type of trips in learning how to design equipment; however, the need for equipping our workforce with up-to-date skills to maximize their resources dictates far more extensive training. The new modern technology is far more complex today and requires intimate knowledge of the systems and closer working relationships between workers, managers and engineers. Training is costly but rewarding in the performance and the enthusiasm with which the workforce has been able to successfully operate the new equipment. At our new Electro-Galvanizing Line project in Cleveland, now under construction at a cost of $125 million, the workforce will be hired in the next several weeks although production is not scheduled to begin until April of 1986. The workforce will participate with management in designing the job structure for this plant and will travel to Japan to get a first-hand opportunity to operate the new equipment. This operation will be designed with work teams. Foreman, as we have traditionally known them, will be leaders and resources to the workforce. This, in many ways, is an experiment for LTV and the United Steelworkers of America, but it represents an earnest effort to be innovative, to take risks and to respond to changes in the way we operate our businesses. This represents a major commitment to the utilization of new technology and work methods to create a cooperative work environment that produces a first-class product. In each of these projects where we have retrained the workforce and made capital investments, we have worked closely with state governments to develop training programs to retrain the existing workforce to develop a competitive operation and to enhance the employment security of everyone involved.

Beyond these specific projects, the quality of our products are being upgraded through the utilization of what is commonly referred to as Statistical Process Control (SPC), or as we refer to it at LTV, Integrated Process Control (IPC), a system of engendering a commitment to "world-class" quality in every individual. The Campbell Seamless operation was the first operating unit in our Company where this new philosophy was installed. This is an exhaustive effort involving countless thousands of hours, but today more than 60% of all of our operations have been covered. This approach to quality represents a modern view that the standards of quality are continually being improved and that quality cannot be inspected into a product at the end of a production cycle. Rather, it is each person's responsibility to build quality into the product that is made. Thousands of hours in training and development of standards have been spent across the Company in achieving this new understanding and commitment to quality.

As a management, we have developed jointly with the United Steelworkers of America, a Labor Management Participation Team process for purposes of seeking solutions to shop floor problems. We are proud to report on the success being experienced with these activities. Each of our four plants in the Youngstown/Warren area, on their own initiative, have voluntarily installed this process. Today, teams are actively at work at the Campbell Seamless, Youngstown Tubular, Mahoning Cold Finish Bar, and Warren operations. Joint labor management cooperative projects are functioning at 13 plants across our company. This effort is part of our overall commitment to create a positive work environment where people are committed to the success of the enterprise. These efforts alone cannot be substituted for investment in technology nor can they save a failing steel plant; such efforts are but one item in a portfolio of items that are necessary to be successful in world-competitive markets.

To this end, the management of our company has taken a leadership role in industry affairs to determine ways that management, labor and government can work together in support of our domestic steel industry. Mr. D. L. Carroll, Vice President, Public Affairs, in 1984 served as co-chairman of the Tripartite Steel Advisory Subcommittee on employment, productivity and adjustments. On May 8, 1984, the Committee agreed upon and set forth the following findings and recommendations:

FINDINGS AND RECOMMENDATIONS

The domestic steel industry is in the process of restructuring. It is important that labor, management and government cooperate to foster a positive environment in which needed changes can best be accomplished. Labor-management cooperation is an essential component.

1. LMPTs

Findings

The Committee agrees that LMPTs are an important concept in improving the competitiveness of the enterprises and enhancing the long term job security of the employees through active participation by workers and management. In order to achieve success, LMPTs need the full endorsement and support of labor and management.

Recommendations

Information about and endorsement of LMPTs should be diffused widely through the collective bargaining process, the Department of Labor and other appropriate organizations to encourage their extension throughout the entire domestic steel industry. The Department in particular can make important contributions in support of the parties' joint efforts. One example is in co-sponsoring conferences like the Indiana Governor's Conference on Labor-Management Cooperation. Another is in publicizing examples of successful cooperation in the industry.

2. Employment Costs

Findings

The Committee recognizes that issues of employment costs are critical areas of concern to a viable and strong industry, and that such issues are matters of labor and management to deal with in the collective bargaining process.

Recommendations

Rising health care costs and other benefits costs are matters for collective bargaining. However, government actions to reduce the costs of health related services are vital to their containment.

Matters that need further review and consideration include the ability to deal more effectively with the problems of fixed versus variable employment costs. To this end, "profit sharing" and other forms of gainsharing discussions between the parties may become an important vehicle in addressing some of these disparities.

Quantitative and qualitative investigations and research by government on an on-going basis must be accomplished to provide data and recommendations to industry and labor representatives in an objective manner as to employment costs and other developments in the world economy that will have an effect on the restructuring process now underway in the domestic steel industry.

3 Employment Security

Findings

The Committee recognizes that work rule changes and remanning to meet competitive needs are matters that can best be accomplished between labor and management in the collective bargaining process on an individual plant level basis. As to the issue of automation and its effect on the workforce, the parties recognize a continuing need to modernize plants and equipment and to this end, the bargaining history represents examples where labor and management have found successful solutions to this problem.

A major inhibitor to changing job duties and other cost reduction efforts is a lack of job security. In order for the industry to address these problems, innovation efforts need to be explored by labor, management and government. One of these alternatives involves work sharing arrangements, especially as practiced in California, Arizona, Oregon, Washington, and Florida. This provides for retention of workers, when faced with temporary reduction in demand, but shortening the work week, with income for the missing days being partially replaced with unemployment insurance.

Another alternative is retaining a portion of those scheduled for layoff in training programs in the plant, for upgrading of skills for operating new equipment, other job related training, and LMPT term training and problem solving.

Recommendations

In planning, designing and installation of new equipment and processes, joint efforts to maximize the impact of those who will operate the system should be undertaken to improve the work environment and the effect on the workforce. The Department of Labor, through its Cooperative Labor-Management Program, should work with labor and management representatives to identify and present alternatives to layoffs and disseminate its findings widely throughout the entire industry. Particular emphasis should be placed on identifying actual cases where alternatives have been tried, both inside and outside the steel industry, since in other industries more experience is available.

As incentives to the parties undergoing change that will enhance and improve the competitive nature of the operations and provide long-term employment security and stability to the industry, the Committee recommends that tripartite efforts should be made to explore alternatives such as ways of using private and public programs such as Trade Adjustment, Unemployment Insurance and SUB to retain employees at work for purposes of retraining and to accelerate reemployment.

4. A Rationale for Adjustment Assistance

Findings

The process of adjustment to drastic changes in the industry creates both individual and community hardship. The alternative demand for displaced steelworkers is often insufficient in several dimensions: limited occupational mobility, large wage differentials, overall insufficiency of demand in many communities, and attitudes and values which inhibit mobility and retraining. The overall problem is also conditioned by a pessimistic view of change which is an outgrowth of historical views of job security. Some laid-off steelworkers may return to their steel jobs as cyclical conditions improve but most laid-off steelworkers, particularly those from shut down plants, must find employment elsewhere.

Recommendations

Retraining and job search assistance should be maximized with companies and unions accepting as much responsibility as is feasible. The Federal Government and the states and localities should support labor-management training and outplacement initiatives which promise to reduce unemployment and reduce dependency on transfer payment programs. The size and nature of the displacement problem is such, however, as to require national funding of retraining and job search activities to serve those whose connections to the industry are severed permanently.

An emphasis on retraining and job search does not foreclose continued and serious examination of employee ownership, alternative uses of facilities and other means through which employment can be maintained.

5. The Administration of Adjustment Assistance for Steelworkers

Finding

The funding and administration of grants and technical assistance for steelworkers who have lost or may lose their jobs requires close monitoring at a time when the industry is changing and the national training policy is also assuming a decentralized and local character.

Recommendation

DOL should create a temporary authority, with tripartite participation, to receive and coordinate comments and suggestions on program delivery problems. We believe that the size and characteristics of the industry's problems justify the establishment of an *ad hoc* committee that will at as an industry oversight group to enhance the administration of a model steel adjustment program.

6. National Support of Local Initiatives

Findings

Retraining initiatives which exhibit exemplary labor-management cooperation and innovation should be conducted. One such effort ought to emphasize retraining within the industry for improving overall productivity. Another might use companies to conduct exit training for high demand occupations.

Recommendations

DOL should set aside a portion of JTPA discretionary funds with priority for jointly sponsored initiatives. Technical and administrative assistance should also routinely be available given the special priority of this industry.

7. Consideration of Alterative National Policies

Finding

Given the unique nature of the unemployment in this industry and particularly its community impact, consideration should be given to alternative national approaches to employee and community adjustment for the purposes of educating all parties.

Recommendation

The Departments of Commerce and Labor should undertake research examining alternative national approaches to employee and community adjustment. This may lead to an international forum on the employment objectives of labor, steel companies and government.

We fully support these recommendations that have been incorporated into a report submitted by the Secretary of Labor to Congress pursuant to a request made in the Trade and Tariff Act of 1984. Attached to this testimony are news articles that publicly reported on these findings and recommendations.

Retraining Displaced Steelworkers

The effects of modern technology on the workforce require new skills to be developed. We believe LTV Steel Company is doing an admirable job in this area. The modernization of our plants and equipment at a time when our operating base is being eroded by cheap foreign imports has reaped havoc on thousands of our employees and created unnecessary insecurity on our thousands of retirees who depend upon a strong, viable company to support their pension payments. The modernization effort has and will continue; nevertheless, the "net effect" has been a level of long-term structural unemployment.

In our efforts to mitigate the effects of unemployment on our employees, we have worked diligently to research, explore and implement efforts to assist those affected by the changes.

A member of our headquarters' staff, Gary L. Wuslich, Director of Participative Programs, is presently serving on the Congressional Office of Technology Assessment Advisory Panel to assess the effects of technology and structured unemployment.

In 1980, we pioneered a private job search assistance and placement effort for our employees when the obsolete open hearth steelmaking operations at our Brier Hill operations were phased out. Ironically, that steelmaking capacity was transferred to Aliquippa which had modern, underutilized BOF capabilities. Today, this modern steelmaking operation stands idle. At this point in time, private assistance to steelworkers in the industry covered under a collective bargaining agreement was unheard of. We utilized the knowledge and techniques heretofore used only for managers and executives. It worked, and made a difference for those affected by this restructuring and displacement caused by modernization. This program was made available to the 1,200 people affected by this plant closing.

In 1982, Colt Industries, the owners of the Crucible steelmaking operations in Midland, Pennsylvania, decided to phase-out its steelmaking operations and shutdown this facility. The shutting down of this operation presented LTV Steel Company with a unique opportunity to purchase this facility and modernize the primary steelmaking operations for our growing specialty steelmaking operations. This opportunity for modernization came at a cost to our Warren, Michigan plant where outdated and obsolete electric furnace steelmaking operations existed. The Warren, Michigan steelmaking operations would soon be replaced by the new, modern electric furnaces and a continuous caster at the Midland Plant facility. In Warren, Michigan, in March of 1983 we again went to work benefiting from our positive experience in Brier Hill and again offered private job search assistance to those affected by obsolesence. We built upon the knowledge gained in pioneering the Brier Hill and Warren, Michigan experience in developing other private worker assistance programs. In Midland, Pennsylvania, in a joint effort with the United Steelworkers of America, we set out to deal with the most challenging task to date, the permanent displacement of 4,000 employees by the former employer at a time when the industry was at its lowest levels of employment since the Great Depression and embroiled in its own fight for survival. The Midland facility had a technologically modern steelmaking operation, and LTV had efficient, well-managed finishing facilities in Louisville, Ohio and Detroit, Michigan. This combination made an ideal fit in our drive to create a "world-class" specialty steelmaking company. The decision to operate only the front end of the

Midland plant and utilize other LTV finishing facilities would result in hiring of only 300 people for the Midland operation, a facility that at the time it was shut down, employed nearly 4,000 people. LTV Steel and the United Steelworkers of America set out to deal with this problem in a manner far different than anything yet approached in our industry. An agreement attached to this testimony as "Appendix Q" established a Joint Company-Union Community Training Committee and set forth a private funding arrangement under the terms of the collective bargaining agreement which provided a seventy-five (75) cent per-hour-worked contribution to the Joint Committees Training Trust Fund. We also set aside another twenty-five (25) cents per hour for each hour worked as a contribution to a community food bank that continues in operation today. The purpose of the Joint Company-Union Community Training program is set forth below:

PURPOSE OF JOINT COMPANY-UNION TRAINING PROGRAM

To provide training or retraining skills that will best provide employment for former employees of Crucible, Inc., and others in the communities impacted by the closing of the Crucible Plant.

FUNCTION OF THE COMMITTEE

The Joint Company-Union Committee will:

1. Seek to formulate comprehensive training programs in occupations that will provide the best opportunity for full-time employment.
2. Obtain available additional funding for training or retraining programs from private or public sources.
3. Prepare the rules and procedures for the program and its operation.
4. To select an Advisory Committee comprised of representatives of Government, Business, Labor and Education to bring to the Committee the knowledge, experience, assistance and advice the Committee needs to perform its function.
5. Make available to the Committee and/or to the members of the Advisory Committee the benefit of other experiences in similar projects or programs to facilitate the function of either or both Committees.

The goals and objectives of that Committee were to:

1. Demonstrate labor-management cooperation in providing assistance to the displaced worker.
2. Reduce unemployment of those affected by the Crucible shutdown and of those indirectly affected in the community of Midland.
3. Provide linkages to community and regional efforts towards attracting new jobs to the Midland area.
4. Provide job search assistance and sponsor retraining efforts.
5. Provide assistance in dealing with social-related problems resulting from unemployment.

We immediately set about developing a structure to manage the problem and attract broad-based community support. Attached to this testimony is that organizational structure setting forth the various parts of our program, an outline of the activities and programs being sponsored as well as a summary profile of laid off Crucible steelworkers. Utilizing private funds, the Joint Committee commissioned a study by the Center for Labor Studies at Carnegie-Mellon University to research the affected population and make recommendations on an appropriate response. The text of the study and recommendations is submitted for your review.

This program, to deal with the effects of a restructuring industry, has been acknowledged as a model of what can be accomplished when labor, management, and government cooperate. This project covers people affected in the states of Ohio, Pennsylvania and West Virginia and in addition to funding provided under the Labor Agreement, has received Job Training Partnership Act funding totalling $2.2 million. Attached to this testimony are press clippings announcing the funding of this project by the Secretary of Labor and the Governor of Pennsylvania. Subsequent to this announcement, Governor Celeste joined this effort and awarded this project up to $500,000 in JTPA funding. The cooperation of private industry, the United Steelworkers of America, State and Federal government has brought to this project a broad range of services to the dislocated steelworker affected by the plant closing. The programs in Midland range from the operation of a resource center that includes basic job finding information such as newspapers, industrial directories and telephone books to secretarial and word processing services that assist in typing letters of applications and resumes. Long distance telephone lines are available and counselling services to individuals on a wide variety of assistance programs. The center offers workshops designed to help individuals sort their personal skills and diagnose what skills they can best present to a prospective employer, or assistance if the individual wants to become self-employed in some type of entrepreneurial venture. A basic skills laboratory or audio visual tutorial system has been purchased and is operating in the center to provide upgrading of skills in reading and mathematics that will better enable participants to compete in skills training classes. The center acts as a broker with local educational institutions to place individuals in quality skills training programs. Working with the local bureaus of employment services from each state, determinations are made on what job training programs provide the best opportunity for long-term future employment and training contracts are then developed with the local schools.

In its most recent accomplishment, the Company-Union Committee joined with a local hospital in sponsoring the development of a Community Health Center that will provide low cost services to laid off steelworkers as well as providing a service to prospective employers who may want to locate in the Midland area. This hospital is located in the former plant dispensary on the Main Street in Midland, Pennsylvania and was made available to the Joint Committee by LTV Steel Company in its interest in supporting the community revitalization effort. A representative of the Joint Committee now serves as the co-chairman of the Health Center's Community Advisory Committee. In an effort to find new directions for the community, the Midland Center for Career Development is serving as a catalyst to support various economic development organizations throughout the regional area. A recent report from CSR Inc., a consulting research firm employed by tne Department of Labor to report on various projects receiving JTPA funding, chronicles the success of this venture.

Today, we are happy to report this retraining venture has made a difference for 354 displaced steelworkers who have found new jobs; another 133 who have received skills training and another 161 people who have upgraded their skills in Basic Reading and Mathematics.

The success of our activities at Midland has encouraged us to begin the development of our latest effort at the Aliquippa Works. Aliquippa, which only a few years ago was the beneficiary of expanded steelmaking operations due to its modern BOF and continuous caster, has succumbed to the intense penetration of foreign steel into our domestic markets. The major portion of this plant is currently idle. At this facility, $600 million in capital improvements were made mostly over the last 10 years to modernize this steelmaking operation. Additional millions were spent in retraining a workforce that exemplifies a willingness to work together in a non-adversarial relationship and fight for its survival. At the time of idling, an extensive retraining effort was underway to upgrade our craft workforce. To deal with the affects of the idling, we have created a Center for Career Development in Aliquippa similar to that in Midland, utilizing a mix of private, State and Federal monies that will allow us in cooperation with the United Steelworkers to offer multiple programs to the displaced steelworker. We are in the process of making applications for funding under JTPA and other programs to provide needed assistance.

We will begin working with local educational organizations to conclude the training started for those craft employees who are now inactive. The Center in Aliquippa is new; however, from the knowledge gained in Youngstown, Warren, Michigan and Midland, Pennsylvania, the support of the government, along with contributions made from labor and management, we believe it will contribute in a significant way to mitigating the effects of this otherwise difficult crisis in the lives of our employees.

What we have attempted to represent here is a company restructuring to meet the continuous needs of modernization of plant and equipment and the developmental requirements of our workforce.

RAYMOND A. HAY

Chairman of the Board and Chief Executive Officer

The LTV Corporation

Remarks at the

Annual Shareholders' Meeting

International Ballroom
Fairmont Hotel
Dallas, Texas

May 17, 1985

While the past year has witnessed many accomplishments of which we are justifiably proud, 1984 and early 1985 have been a difficult time for LTV.

Essentially, we have operated in three distinct environments, as reflected in the operating results for each of our major lines of business.

In steel, we experienced a large operating loss because of steel imports, deep price discounting, surplus inventories, and low operating rates. We were able to achieve many of the benefits expected from the Republic merger, but we lost market share in certain key markets, which contributed substantially to our losses.

In energy products, there was little change from the depressed conditions of the previous two years. The market for oilfield supplies and equipment continued to be plagued by weak demand and excess inventories. And the market for oil country tubular products was inundated by a flood of imported goods.

In contrast, our aerospace/defense business enjoyed its best year in history, as both sales and earnings reached record levels. Our two newest divisions made an important contribution to that performance. AM General generated 45 percent of our defense-related revenues in its first full year as an LTV company, while sales of electronic equipment by Sierra Research increased almost 150 percent from early 1984 to early 1985.

On a consolidated basis, the bottom line for LTV in 1984 was a net loss of $378 million, including special charges of $132 million for rationalization of steel and energy products operations.

1985's first quarter was a replay of the second half of 1984. Aerospace turned in another strong performance with operating income of $29 million. Energy products almost broke even, but steel suffered another large deficit. As a result, the company reported a consolidated net loss of $156 million for the three-month period.

Obviously this is a trying period for LTV. In spite of our success in cutting costs...in spite of progress in improving productivity...the fact remains that we have accumulated losses of more than $700 million in the last three calendar years -- most of it in the steel business.

It is essential that we use every means available to put a stop to these losses and restore LTV to profitability. And we are totally committed to that goal.

Consequently, LTV has undertaken a broad, three-part program to deal with its most serious problems:

- The profitability of our steel operations,
- The liquidity of the corporation,
- And the external factors that impact our results.

Earlier this week, we launched a major reorganization of LTV Steel, designed to make our steel operations more efficient and competitive.

Dave Hoag, the president and CEO of LTV Steel, and I have divided the company into three new, stand-alone operating companies -- to be known as LTV Steel Tubular Products, LTV Steel Specialty Products and LTV Steel Flat Rolled and Bar. Three outstanding individuals will serve as presidents of the new companies. They are Paul Wigton, Claude Kronk and Russell Maier. All three will report to Dave Hoag.

This reorganization recognizes the fact that each of the new steel companies has different customers and markets, with their own unique needs for quality, timeliness and service. We expect each stand-alone company to provide immediate benefits for its customers.

Each company must also deal with different competitors -- be they integrated producers, minimills, foreign steel or some combination of the three. We expect each company to take all the actions necessary to achieve greater efficiency and productivity to match or exceed its competition. Each is designed for quick, decentralized decision-making. And each will have greater autonomy, leverage and freedom to pursue strategies which will ensure profitability in both the short term and the long term.

The organizational concept is identical to that of LTV Aerospace and Defense Company. In January 1983, we established a small corporate staff with four stand-alone operations under it. It has proved to be a very successful means of operation, particularly in its ability to improve the productivity of each operating unit, to better service specific markets and customers, and to grow each company's business profitably.

We are confident that similar results will be achieved through the new structure of the steel group.

In order to improve our steel performance, it has also become necessary to reassess steelmaking operations at facilities where we have incurred the most severe and consistent losses.

As a result, we have decided to indefinitely idle the primary operations at our Aliquippa Works near Pittsburgh.

This action reflects an urgent need to eliminate the impact of continuing losses incurred at Aliquippa over the last several years, which culminated in an estimated loss of $25 million in the first quarter of this year. The idling of these operations will reduce steelmaking costs, generate cash savings and have a substantially favorable impact on future results.

In connection with this action, LTV will take a charge of approximately $400 million against second-quarter earnings. This charge recognizes the decreased value of the facility and other costs and expenses associated with the idling.

Operations to be idled include the coke and by-products facility, the blast furnace complex and the steelmaking and rolling operations. Only the 14-inch structural products mill and the tin plate mill will remain active.

The decision to idle Aliquippa did not come easily. It is a tragedy not only for the 1,300 employees who will be affected...but also for the community which grew up around the plant, and for the entire American steel industry. Aliquippa is testimony to the havoc which has been wrought by unfairly traded foreign steel.

While the plant has operated for 78 years, this was no antiquated, neglected steelmaking facility. LTV has spent more than $600 million -- most of it since 1975 -- to keep the facility efficient, competitive and environmentally safe. For most of its history, Aliquippa represented the epitome of modern, 20th century steelmaking; a pioneer in new products and steelmaking processes. It was here where the first major basic oxygen furnace in North America was installed and it was here that we installed our first continuous caster.

Neither is Aliquippa a site of labor strife and turmoil. With the help of enlightened union leadership, the plant introduced the Labor Management Participation Team process to the industry, and was among the first to adopt the concept of Employee Involvement Teams and other innovative manning and work agreements.

Over the years, Aliquippa produced a wide array of products including steel bars, seamless and welded oilfield pipe and casing, rod and wire, light structural steel, strip, tin plate, fence wire...and even nails. As recently as 1981, Aliquippa employed almost 10,000 workers and shipped more than two million tons of steel.

One by one, many of Aliquippa's products fell prey to the flood of imported steel. As imports have increased each year since 1981, our markets disappeared...steelmaking was reduced...and finishing operations were curtailed. As a result, this giant, seven-mile-long facility has been running at only 20 percent of its operable capacity. That's well below the point at which it could make a profit, and the losses have mounted to the point where we can no longer sustain the facility.

The third part of our program to restore profitability in steel is an unrelenting attack on costs. With the competitive pressures of the marketplace from both foreign imports and domestic minimills, we cannot rely on price increases to ensure profitability.

We will, therefore, continue our ongoing effort to obtain lower prices on all supplies and services...particularly our sources of iron ore and coal. Negotiations with these suppliers have already yielded significant cost reductions and more are expected. Elsewhere throughout the company, we will employ every conceivable measure to increase productivity and reduce costs across the board.

I believe these three actions -- the reorganization to better serve our customers, the idling of Aliquippa, and across-the-board cost reductions -- will result in a major positive impact on the profitability of our steel business.

LTV's second major effort is an aggressive debt and asset restructuring program for 1985 and 1986.

One step in this program involves additional divestitures. Through the first four months of this year, LTV realized proceeds of approximately $75 million from the sale of certain non-steel assets acquired in the Republic merger. We expect to realize an additional $50 million from similar divestitures in progress.

We are now initiating a divestiture and joint-venture program that could generate additional cash of about $500 million over the next 18 months. We are in the process of identifying business units which, in the aggregate are marginally profitable and which will be candidates for this program.

The second step in this program is intended to conserve cash. We plan to request approval from the Internal Revenue Service to defer payments scheduled for September on several pension plans associated with our steel business. This deferral would result in a 1985 cash savings of about $180 million. I want to emphasize that the waiver would in no way affect payments to current or prospective retirees. Under current law, the deferred payments must be restored to the pension fund over a 15-year period.

This asset and debt restructuring program is a very important part of our total effort. It is designed to improve our cash flow over the next two years by almost $700 million...and will strengthen our balance sheet, maintain liquidity and provide funds for growth opportunities...particularly the continued development of our aerospace/defense business.

The internal program I have outlined represents a determined effort to effectively manage the competitive factors within our control. However, we are also affected by a number of external factors over which we have limited influence even though they have a severe impact on our operations.

These include:

- The strength of the dollar in comparison to other world currencies,
- The large federal budget deficit,
- High interest rates which penalize capital intensive basic industries,
- And unfair trading practices by foreign governments which are based as much on politics as economics.
- All of which lead to a steadily increasing trade deficit and the flight of U.S. manufacturing to overseas sites.

All of these have contributed to the surge of steel imports that have swamped the United States, and to the growing sale of foreign-made products containing steel -- products once made in America with American steel.

Although imported steel has been a serious problem for many years, it reached crisis proportions in 1984. What started as a year of recovery, was quickly aborted when steel imports reached unprecedented levels during the second half. LTV was among those hardest hit, since it was in this period that we were trying to implement the merger with Republic and realize the operating benefits involved.

During 1984, imports accounted for more than 26 percent of the domestic steel market. While foreign firms increased their tonnage by 53 percent over the previous year, shipments by domestic steelmakers registered only a 9 percent improvement, under very depressed pricing conditions.

The significance of these figures is that the increased demand for steel in the United States last year was almost completely absorbed by imports. Had imports remained even at the 20 percent level of the previous three years, U.S. producers would have been able to show a profit instead of absorbing another year of losses.

In mid-September, President Reagan took a long overdue step, calling for export restraint agreements by all of the major steel exporting nations. The target is to limit imports of finished steel products to 18.5 percent of the market and semi-finished steel imports to 1.7 million tons per year for a five-year period.

Thanks to the effort of the U.S. Trade Representative, most of these countries have signed agreements. But we are alarmed that no meaningful reduction of imports has taken place. There has been a slight month-to-month decline since the beginning of the year, but for the first quarter imports still averaged more than 27-1/2 percent of the market. For this reason, we have committed ourselves to a continuing agenda dealing with the import problem.

We are determined to do all that is possible to ensure that President Reagan's export restraint program succeeds. If, however, because of reluctance or recalcitrance by our trading partners -- or for any other reason -- meaningful relief is not promptly attained through this program, LTV is prepared to take its case to the courts and to Congress.

As we look ahead to the remainder of 1985, the picture is not at all clear. We expect to report a net loss for the second quarter; but the loss should be reduced due to lower operating losses in steel, where results have shown significant improvement beginning in March.

We expect another excellent year for aerospace/defense, with results better than those of 1984. Our energy products business may also show modest improvement, but not enough to make a significant impact on consolidated results.

The major unknown is in steel. Much depends on the outcome of domestic policies being debated in Congress, and upon the degree of compliance and enforcement applied to the import restraint program. Much also depends upon the success -- and the commitment of everyone involved -- to restructure steel operations, reduce costs, increase productivity and do a better job of meeting the needs of the marketplace.

I am totally dedicated to any and all actions necessary to ensure that LTV returns to profitability. That is the objective of the measures I have outlined today.

Thank you.

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K
ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF
THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 1984 Commission File Number 1-2388

LTV STEEL COMPANY
(Exact name of registrant as specified in its charter)

New Jersey (State or other jurisdiction of incorporation or organization)	34-0486510 (I.R.S. Employer Identification No.)
LTV Steel Building Cleveland, Ohio (Address of principal executive office)	44115 (Zip Code)

Registrant's telephone number, including area code (216) 622-5000

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each Exchange on which registered
4 3/8% Sinking Fund Debentures, Due 1985	New York Stock Exchange
8.90% Sinking Fund Debentures, Due 1995	New York Stock Exchange
12 1/8% Subordinated Debentures Due 2003	New York Stock Exchange
6 3/4% Subordinated Debentures, Due 1994	New York Stock Exchange
First Mortgage Bonds - Series F, 9 7/8%, Due 1995	New York Stock Exchange
First Mortgage Bonds - Series G, 8%, Due 1998	New York Stock Exchange
First Mortgage Bonds - Series N, 9 3/4%, Due 1996	New York Stock Exchange
First Mortgage Sinking Fund Bonds - Series H, 4 1/2%, Due 1990	New York Stock Exchange
First Mortgage Sinking Fund Bonds - Series J, 10 1/2%, Due 2000	New York Stock Exchange
First Mortgage Sinking Fund Bonds - Series K, 9 3/8%, Due 1991	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

None

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ✓ No___

State the aggregate market value of the voting stock held by non-affiliates of the registrant. None.

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the close of the period covered by this report.
1,000 shares of Common Stock

The Registrant meets the conditions set forth in General Instruction J.(1)(a) and (b) of Form 10-K and is therefore filing this Form with the reduced disclosure format.

PART I

ITEM 1. BUSINESS.

Introduction

The Registrant was organized as a New Jersey corporation in 1899. In December 1984, Republic Steel Corporation ("Republic") was combined with Jones & Laughlin Steel Incorporated ("J&L" or "J&L Steel") and changed its name to LTV Steel Company, Inc. ("LTV Steel" or the "Company"). LTV Steel's principal office is located at LTV Steel Building, Cleveland, Ohio 44115 and its telephone number is (216) 622-5000.

All of the outstanding common stock of LTV Steel is owned by The LTV Corporation ("LTV"), a Delaware corporation.

LTV Steel is a fully integrated steel producer and, as a result of the combination, the second largest steel operation in the United States. The Company is the largest producer of hot and cold rolled sheet for the automotive and consumer durable goods markets and high quality bar products and a major producer of seamless tubular products for the oil and gas industry.

LTV Steel competes with both domestic and foreign steel producers and is subject to a number of federal, state and local statutes concerning environmental matters.

On November 30, 1984, the Company sold certain net assets of its tubular products finishing plants to LTV Tubular Products Company ("LTV Tubular"), an LTV subsidiary. The results of operations of these tubular products facilities for the eleven months of 1984 are included with LTV Steel's operating results. On July 31, 1983, the Company sold all of its stainless steel finishing operations, including related assets and liabilities, to LTV Specialty Steels, Inc. ("LTV Specialty Steels"), an LTV subsidiary. LTV Steel's operating results for 1983 include the operating results of LTV Specialty Steels for the first seven months of the year.

Steel Operating Rate and Steel Imports

The Company's average operating rate was 50% in 1982, 57% in 1983 and 54% in 1984.

During 1984, the steel operating rate declined throughout the year, with a rate of 70% for the first quarter, 68% for the second quarter, 47% for the third quarter and 45% for the fourth quarter. During the second half of the year, the Company, taking advantage of an opportunity presented by the combination of J&L and Republic and because of reduced demand, eliminated 350,000 tons of steel from its inventory.

Steel operating rates have been negatively affected throughout the three year period but in an increasingly dominant way in the latter part of the period by record levels of imports of foreign steel. Such imports accounted for 26 million tons or 27% of apparent domestic consumption in 1984, with surges at times during the second half of 1984 accounting for as much as 32% of domestic consumption. Imports during 1984 increased by 53% over the prior year. Because of the large increase, conditions of oversupply existed in the domestic market and deep price discounting occurred as producers sought to retain their market share.

Each of the Company's three major product lines - flat rolled, bar and tubular (sold in November 1984) - is being negatively impacted by imports. The market for oil country pipe and tubular products was most affected, where foreign products accounted for almost 60% of the market.

Many of the importing countries are believed by the industry and others to be engaged in unfair trading practices, including dumping, government subsidization and protection of home markets which has had the effect of diverting additional third country steel to the U.S. market. This belief was in large part confirmed by the various rulings issued in favor of the domestic steel industry by the U.S. courts, the International Trade Commission ("ITC") and the U.S. Department of Commerce as a result of the unfair trade suits filed by the domestic producers against dumped and subsidized steel imports. Further, in July 1984, the ITC ruled that increases in imported steel had been a substantial cause of injury on a wide range of product lines.

As a result of the substantial negative effects that such imports were having on the domestic steel industry, a number of actions have been taken in the last three years by the U.S. Government in an attempt to reduce the level of imports.

In October 1982, the U.S. Government, the European Economic Community and European Coal and the Steel Community ("EC") entered into arrangements limiting exports of certain covered carbon and alloy steel products from the EC to the United States. One portion of the arrangement covering pipe and tubing continues through 1986. Other portions continue through 1985, with provisions for consultation for extension upon the mutual consent of the parties. The export limitations restrict imports to approximately 5.4% of domestic consumption.

In early July 1983, the President imposed four-year supplemental declining *ad valorem* tariffs on stainless steel sheet and strip and plate products to supplement an already existing basic tariff and any other tariff imposed in countervailing duty and antidumping cases. The tariffs imposed on stainless sheet and strip are 10% for the first year declining to 8%, 6% and 4% in subsequent years. The tariffs on stainless plate are 8% in the first year declining to 6%, 5% and 4% in subsequent years. Additional dumping duties and countervailing duties are applicable to certain stainless products from certain countries.

In September 1984, President Reagan announced a Comprehensive Fair Trade Program designed to provide additional import relief to the domestic steel industry. The President instructed the United States Trade Representative to negotiate bilateral surge control arrangements with major steel exporting nations with the objective of returning imports of finished steel to a level of approximately 18.5% of the domestic market. Imports of semi-finished steel are expected to be about 1.7 million tons per year compared to about 1.5 million tons for 1984. The program is intended to cover exports leaving the country of exportation on and after October 1, 1984.

As of mid-March 1985, signed agreements had been reached with Brazil, Finland, Spain, South Africa, Mexico and Australia. Imports from these countries accounted for approximately 4.76% of domestic consumption during 1984; these agreements are designed to reduce such imports from these countries to 2.65% of such consumption. See above for information relating to the agreements with the EC countries. Signed agreements with Japan, South Korea and Czechoslovakia are expected shortly, and negotiations with other countries are continuing. The President's program to restrain steel exports to the United States will continue for five years assuming the President makes an annual finding that the major domestic steel companies, taken as a whole, are reinvesting substantially all of their available net cash flow from steel operations to modernize the steel industry and 1% of available net cash flow from steel operations to retrain workers.

In announcing this program, the President stated his hope that the program ". . . would enable one of the United States' more basic and vital industries to return to a level playing field, one in which steel is traded on the basis of market forces, not government intervention, and one in which the market would seek a return to a more normal level of steel imports, of approximately 18.5 percent, excluding semi-finished steel." It is too early to be certain whether this expected result can be attained. The actual level of imports in 1985 and thereafter will be determined by a number of factors, including the effective enforcement of the arrangements which have been agreed to, the successful conclusion of the arrangements currently under negotiation, the timing of the full impact of these arrangements and the effective enforcement of United States unfair trade laws with respect to imports from other countries not covered by arrangements.

For additional information on the depressed operating rate of facilities producing bar, seamless and structural products, which has been negatively affected both by imports of unfinished steel and by imports of semi-finished steel and finished steel products, see "Item 2. Properties - Steel Facilities."

CONTINUING EFFECTS OF IMPORTS

Because of the continuing conditions of oversupply and deep price discounting which have occurred in the domestic marketplace as a result of the continuing high level of imports, the operating losses experienced in the fourth quarter of 1984 have continued into 1985.

FORMATION OF LTV STEEL COMPANY, INC.

On June 29, 1984, Republic, one of the five largest integrated steel producers in the United States, became a wholly-owned subsidiary of LTV (the "Merger"). Subsequently, Republic's steel operations were combined with those of J&L to form LTV Steel. In addition to producing steel in carbon grades, Republic was one of the industry's largest producers of alloy and stainless steels. Republic produced a diversified line of steel mill products and a variety of fabricated steel products. Republic also had raw material reserves of iron ore, coal and limestone.

During the year ended December 31, 1983 and the six months ended June 30, 1984, Republic had sales of $2.7 billion and $1.7 billion, respectively, and net losses of $326.5 million and $77.7 million, respectively. During such periods, J&L had net sales of $2.8 billion and $1.7 billion, respectively, and net losses of $294.5 million and $40.2 million, respectively.

Republic's past product pattern is reflected in the following table which shows the percentage by sales dollar and tonnage of shipments of steel mill products for the periods indicated.

	1982		1983		1984*	
	Revenue	Tons	Revenue	Tons	Revenue	Tons
Sheet and strip	43%	57%	53%	61%	55%	62%
Bar	28	22	28	22	26	21
Tubular products	17	10	9	7	10	8
Other	12	11	10	10	9	9
Total	100%	100%	100%	100%	100%	100%

* Represents activity for the first 6 months of 1984.

In February 1984, the Antitrust Division (the "Division") of the U. S. Department of Justice indicated it would oppose the Merger and in March 1984, following extensive negotiations, the Division, LTV, Republic, J&L (now a part of LTV Steel) and J&L Specialty Steels, Inc. (now LTV Specialty Steels, Inc.) entered into a stipulation and consent decree (the "Decree") settling a complaint filed by the Division in the U. S. District Court for the District of Columbia (the "Court"), providing, among other things, for divestiture of the facilities of Republic at Gadsden, Alabama and the stainless sheet facilities of Republic at Massillon, Ohio by December 1, 1984. The Massillon facilities were sold in late 1984. Because LTV was unable to divest Gadsden by December 1, 1984, the Court appointed a trustee to effect the divestiture at such price and on such terms as may be obtainable upon a reasonable effort by the trustee in accordance with the Decree.

In mid-1984, LTV formed a separate company Gulf States Steel Corporation ("Gulf States Steel") to own and operate the Gadsden facilities and in October 1984, LTV announced that discussions had begun with the United Steelworkers to explore a plan whereby LTV would provide for eventual ownership in the company by the employees. These discussions are preliminary in nature and are continuing but LTV cannot predict what, if any, agreement may result. Any agreement that might be reached as a result of these discussions would be subject to the approval of the U.S. Department of Justice.

Although the process of rationalizing the combined operations of J&L and Republic is continuing, the results of the economies of operation and lower capital expenditure requirements expected to result from the combination have not been realized in some instances (although they have been realized in part) and have been delayed in others because of the extremely adverse business conditions under which the combined steel operations have had to operate.

BUSINESS AND PROPERTIES OF LTV STEEL

Introduction

The Company is the second largest steel operation in the nation and is a fully integrated steel producer. Its product lines include hot and cold rolled sheet and strip to make products such as automobile bodies, consumer durable goods, farm equipment, industrial machinery, office equipment and machine parts; galvanized and other coated flat rolled products for auto body components, air-conditioning duct work, water storage tanks and prefabricated building panels; tin mill products for cans and closures; hot rolled and cold finished bars for car, truck and heavy equipment components such as axles, drive shafts, engine and transmission parts, as well as tools, chains and fasteners; and light structurals for the construction industry. Sales of steel mill products account for substantially all of the net sales of the Company.

LTV Steel has taken a number of steps to reduce costs, conserve cash and increase productivity in an effort to compete in a market where conditions of overcapacity and oversupply exist and have placed extreme pressure on selling prices. These efforts have been concentrated primarily in the areas of capital spending avoidance, inventory level reductions, salaried and hourly work force reductions and optimization of the most efficient facilities. At the same time, LTV Steel has taken steps to improve the product quality of its steel products. In February 1985, LTV entered into a partnership arrangement for the building and operation of an electro-galvanizing line ("EGL") which is designed to enable LTV to meet the demands of the automotive industry for corrosive resistant, high quality finish flat rolled steel. LTV Steel's participation will be to sell the production from the EGL. For more information, see "Electro-Galvanizing Line."

Incidental to its steel business, the Company is engaged in and has interests with others in ventures engaged in the mining of iron ore and coal and the quarrying of limestone.

The federal government and various state and local governments have regulations concerning the discharge of materials into the environment or otherwise relating to the protection of the environment. For a description of the effect upon the Company of compliance with such laws and regulations, see "Item 2. Properties - Property Additions and Capital Expenditures" and "Item 3. Litigation and Other Proceedings Involving LTV Steel - Environmental Control Matters."

Information shown herein includes data for J&L for all periods and Republic, now a part of LTV Steel, since the effective date of the combination of Republic and J&L for accounting purposes on July 1, 1984.

Steel Production

The following table indicates raw steel production and estimated capability information for both LTV Steel and the domestic steel industry during the periods indicated:

	1982	1983	1984**
Capability (net tons in thousands)			
LTV Steel	12,973	13,075	17,151
Industry*	154,000	150,600	135,318
Percent of Industry	8.4%	8.7%	12.7%
Production (net tons in thousands)			
LTV Steel	6,486	7,454	9,349
Industry*	74,577	84,615	91,532
Percent of Industry	8.7%	8.8%	10.2%
Production as a Percentage of Capability			
LTV Steel	50.0%	57.0%	54.5%***
Industry*	48.4%	56.2%	67.6%

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*The information relating to the domestic steel industry is as reported by or is derived from data reported by the American Iron and Steel Institute ("AISI") and is preliminary for 1984. A net ton is 2,000 pounds.

**The information includes data of Republic from July 1, 1984.

***The low percentage in 1984 compared to that of the Industry is the result in part of the Company's inventory reduction program.

The low rates of production of raw steel and steel products during 1982, 1983 and 1984 experienced by the Company and the domestic industry as a whole resulted primarily from the rising level of imports of steel products, the generally adverse economic conditions in 1982 and 1983, and depressed demand during the approximate three-year period for tubular products by the oil and gas industry. See "Competition" and "Steel Operating Rate and Steel Imports." The increase in production during 1983 and 1984 from 1982 reflected higher demand for flat rolled products, especially by the automotive market, and the addition of sales from Republic's operations.

The Company produces its steel requirements by the basic oxygen furnace process at Aliquippa, Cleveland, Indiana Harbor, Chicago and Warren and by electric furnaces at Cleveland, Pittsburgh, Chicago and Canton. Producing at full capacity, the Company is able to continuously cast approximately 31% of its steel production. See "Properties."

Steel Mill Products

LTV Steel is the second largest domestic steel producer and is the largest supplier of flat rolled products to the automotive, consumer durable and other markets and of high quality bar products.

During the three years 1982 through 1984, the Company accounted for 8.6%, 8.5% and 10.6%, respectively, of total domestic industry shipments of steel mill products. With the inclusion of Republic's steel operations, the Company's share of the domestic steel shipments increased to 12.8% during the last half of 1984. The net tons of steel mill products shipped by the Company during the three years, including a minor amount of products produced by others, were: 1982 - 5,142,000, 1983 - 5,709,000, 1984 - 7,738,000. The increase in tonnage in 1984 over 1983 resulted from increased shipments in the first half of 1984 and includes shipments of Republic from July 1, 1984.

The Company's product pattern is reflected in the following table which shows the percentage, by sales dollar and tonnage of shipments, of steel mill products for the periods indicated:

	1982		1983		1984*	
	Revenue	Tons	Revenue	Tons	Revenue	Tons
Hot and cold rolled sheet and strip and light plate..	35%	53%	49%	61%	46%	57%
Tin mill and galvanized products....................	25	25	30	25	23	20
Tubular products..............	20	11	3	5	7	6
Stainless steel...............	6	2	5	1	-	-
Bar...........................	6	6	6	5	12	11
Light structurals and other....................	8	3	7	3	12	6
Total....................	100%	100%	100%	100%	100%	100%

*The information includes data of Republic from July 1, 1984.

Sales and shipments of flat rolled sheet and strip products and tubular products were at a depressed level throughout most of 1982, contributing to the low level of total shipments during 1982. In 1983 and 1984, shipments of flat rolled products increased substantially while shipments of tubular products remained depressed.

The low level of revenues from tubular products in 1982 resulted from a sharp reduction in the demand for tubular products from the record levels in 1981, increased penetration by imported products and a deterioration in the Company's mix of higher priced, high strength tubular products. After the first quarter of 1982, the rate of tubular steel production and shipments declined sharply, primarily as a result of lower rates of drilling, the liquidation by customers of their levels of inventories and the continuation in the surge of underpriced imported tubular products into the depressed market. Excessively high levels of user and distributor inventory and decreased oil and gas drilling activity existed throughout 1984, and rates of tubular steel production and shipments continue to be extremely depressed. Effective November 30, 1984, the Company sold the inventory, certain property, plant and equipment and related assets and liabilities of its tubular products finishing plants to LTV Tubular Products. See "Disposition of Assets" in the footnotes to the financial statements.

The percentage tonnage distribution of the Company's shipments of steel mill products among various markets during the periods indicated is set forth in the following table:

	1982	1983	1984
Automotive	20%	26%	29%
Steel service centers	23	25	22
Construction	12	11	9
Containers and packaging	11	10	8
Electrical, agricultural and other machinery	11	9	10
Household appliances and office equipment	8	9	7
Converters and resale	7	8	10
Oil and gas	6	1	2
All other	2	1	3
Total	100%	100%	100%

Shipments during the years 1982, 1983 and 1984 to the Company's largest unaffiliated customer, General Motors Corporation, represented approximately 8%, 13% and 12%, respectively, of the Company's gross sales in dollars.

The Company's share of industry shipments of steel mill products to the automotive market, which in 1982 did not change materially from recent prior years, improved significantly during 1983 and 1984. Total tons shipped to the automotive market by the Company also improved significantly in 1983 and 1984 and the expected high level of sales of 1985 model cars is expected to have a continuing favorable influence on the level of shipments. Because of imports creating conditions of over-supply, however, prices for such steel remain severely depressed.

Competition

Principal factors which historically have affected competition in the steel industry include quality, availability (including the availability of imported steel), customer service and the ability to meet prevailing prices, which recently have been depressed because of over-supply conditions. The steel industry also faces competition from manufacturers of competitive products other than steel (e.g., aluminum, plastic and glass).

During the last three years, competition among domestic steel producers, including mini-mills, and from foreign steel producers, principally those located in Japan, the European Economic Community ("EEC"), Canada and certain Third World countries has become increasingly intense as the importation of foreign steel, often under conditions believed to be in violation of the fair trade laws, has risen to unprecedented levels causing conditions of over-supply and deep price discounting in the domestic marketplace. See "Steel Operating Rate and Steel Imports" above for more information on the recent level of imported foreign steel. While LTV Steel is unable to predict the extent of future competition and the effect of such competition upon its business and resources and upon future capital expenditures, it is expected that the industry will continue to be characterized by strong and intense competition. Future foreign and domestic competition will depend upon a number of factors, including inflation, labor relations and economic conditions in the U.S. and in the competing foreign countries, the U.S. government's ability and willingness to protect the domestic industry against unfair foreign competition, and the extent to which competitors make discretionary expenditures in their steel businesses. See "Electro-Galvanizing Line" below for information relating to the Company's participation in the electro-galvanizing line being constructed by LTV to produce galvanized steel principally for the automotive market.

Based on AISI reports, during the three years 1982 through 1984, imports of steel mill products totaled approximately 16,663,000, 17,070,000, and 26,171,000 net tons, respectively, or approximately 22%, 21% and 27%, respectively, of the total steel purchased for consumption in the domestic market. See "Steel Operating Rate and Steel Imports" above for additional information.

Electro-Galvanizing Line

In February 1985, a subsidiary of LTV entered into a partnership agreement with a subsidiary of Sumitomo Metal Industries, Ltd., to build an electro-galvanizing line and produce one-sided, two-sided and differentially coated electrolytically galvanized flat rolled steel for the U.S. automotive industry. The electro-galvanizing process offers superior corrosion-resistance and finish features. The partnership is 60 per cent owned by a subsidiary of LTV and 40 per cent owned by a Sumitomo subsidiary. The line, which will be located in Cleveland, Ohio, is expected to cost in excess of $125 million and be in operation by the spring of 1986. The annual rated output for the line is approximately 500,000 tons of annealed and tempered steel. Financing for the line is being provided by Mitsui & Co. (U.S.A.), Inc. and Mitsui & Co., Ltd. LTV Steel's role in the EGL project will be to sell the steel produced by the EGL, primarily to the major automobile manufacturers.

Research and Development

Expenditures by the Company totaled $9.5 million in 1982, $8.1 million in 1983, and $13.2 million in 1984. The Company is continuing to emphasize activities directed primarily at improving current operations and quality control and developing, testing and refining new grades of steel and improving the qualities and characteristics of its products.

Other Aspects Relating To LTV Steel

Use of Fuel by LTV Steel

From time to time since 1973, there have been shortages of energy available (with resultant increases in energy prices) for use by consumers in the United States and in certain other countries. LTV Steel has not suffered any material adverse effect upon its operations as a result of such shortages, but the energy shortages and increased costs of available energy have resulted in increased fuel costs.

LTV Steel is not self-sufficient in energy and, although supplies are presently plentiful, any major reduction in energy sources for which alternative fuels cannot be substituted could have a substantial impact on production, sales and results of operations. Further, the Company is a substantial user of natural gas, and deregulation of natural gas prices could have a substantial effect upon its cost of operations.

Government Regulations

LTV Steel is subject to various environmental and related laws, including the Clean Air Act, the Federal Water Pollution Control Act, the Resource Conservation and Recovery Act, the Surface Mining Reclamation and Enforcement Act, the Toxic Substances Control Act, the Superfund Act, the Federal Occupational Safety and Health Act and the Federal Mine Safety and Health Act. For a description of the effect of compliance with such laws and regulations by the Company, see "Properties - Property Additions and Capital Expenditures" and "Litigation and Other Proceedings Involving LTV Steel - Environmental Control Matters."

Employees

As of December 31, 1984, the Company had approximately 35,000 active employees, of whom approximately 24,900 were hourly employees, primarily production and maintenance employees, and the remainder were salaried employees, engaged primarily in administrative, production supervision, engineering, research, sales and clerical work. Hourly paid employees are represented by unions, including the United Steelworkers of America ("USW") and the United Mine Workers of America ("UMW") which represent approximately 24,000 active employees. At December 31, 1984, approximately 19,000 employees were on lay-off status.

In February 1983, the Company and the USW reached a new labor agreement covering substantially all Company employees represented by that union. The concessionary agreement, which covers a forty-one month term ending August 1, 1986, provided for, among other things, a reduction of $1.25 in 1983 per hour from base wages (which reduction is being restored between February 1, 1984 and February 1, 1986 pursuant to a schedule), and a temporary suspension in cost of living benefits. Additionally, there were other reductions in employee benefits, some of which will be restored during the life of the agreement. The Company agreed, among other things, to invest savings from these concessions in existing steelmaking facilities or to preserve the working capital needs of such facilities.

The wage agreement with the UMW to which the Company is a party expires January 31, 1988.

ITEM 2. PROPERTIES

LTV Steel leases 301,000 square feet of office space in the LTV Steel Building in Cleveland, Ohio, for its principal corporate offices under various leases with terms of up to ten years. The following sets forth a description of the properties of LTV Steel. Although the Company's facilities are, in general, adequately maintained and suitable for their operations, the Company currently has certain facilities that are temporarily idle or operating well below their capacity. Additionally, the Company's facilities rationalization process resulting from the combination of Republic and J&L's steel operations (which process is continuing) has resulted in non-cash charges and establishment of reserves for certain facilities. Certain other steel facilities, which have become duplicative as a result of the combination, may not be refurbished as they approach the end of their useful lives. For more information on idled facilities and non-cash charges, see "Other" below.

The principal facilities of the Company consist of steel works located at Aliquippa and Pittsburgh, Pennsylvania; Cleveland, Canton and Warren, Ohio; Chicago, Illinois; and East Chicago, Indiana; and a steel finishing plant at Hennepin, Illinois.

Flat Rolled Products Division

(1) Steel Producing Properties

Cleveland Works - Cleveland, Ohio

The Cleveland Works covers approximately 1,187 acres on the east and west banks of the Cuyahoga River. Facilities include coke batteries, blast furnaces, basic oxygen furnaces, electric furnaces, a continuous slab caster, slabbing mills, hot strip mills, cold reducing mills, sheet finishing mills and an electroplate line.

Indiana Harbor Works - East Chicago, Indiana

The Indiana Harbor Works covers approximately 1,150 acres along the shore of Lake Michigan about 20 miles east of Chicago. Major facilities include coke batteries, blast furnaces, basic oxygen furnaces, a continuous slab caster, a slabbing mill, a hot strip mill, a cold reducing mill and a sheet finishing mill, galvanizing lines, and a tin mill.

Warren Works - Warren, Ohio

The Warren Works covers approximately 1,130 acres. Major facilities include a coke battery, blast furnace, basic oxygen furnaces, a blooming mill, a hot strip mill, a cold reduction mill and sheet finishing mill, a galvanizing line, a silicon line and a terne line.

(2) Steel Finishing Properties

The Flat Rolled Division properties include finishing operations located in Hennepin, Illinois. The Hennepin Plant covers approximately 6,000 acres on the bank of the Illinois River approximately 125 miles southwest of Chicago. The Hennepin Plant, which receives semi-finished products from the steel producing plants, includes a cold reducing mill and a sheet finishing mill and a galvanizing line.

(3) Other Properties

Other principal facilities include coke batteries located in Youngstown, Ohio, a sheet finishing mill in Niles, Ohio and a tin mill located at the Aliquippa Works.

Bar Products Division

(1) Steel Producing Properties

Aliquippa Works - Aliquippa, Pennsylvania

The Aliquippa Works covers approximately 716 acres on the bank of the Ohio River and is located 19 miles northwest of Pittsburgh. Facilities include coke batteries, blast furnaces, basic oxygen furnaces, a continuous round/billet casting unit, a blooming mill, a billet mill and a bar and light structural mill.

Pittsburgh Works - Pittsburgh, Pennsylvania

The Pittsburgh Works covers approximately 324 acres on the North and South banks of the Monongahela River. Facilities include coke batteries, electric furnaces, a blooming mill, hot rolled bar mills and cold finished bar mills. The Pittsburgh Works furnishes coke and steel slabs to other steelmaking facilities and steel products to the Company's cold finished bar plants.

Canton/Massillon Works - Canton/Massillon, Ohio

The Canton and Massillon complex covers approximately 1,130 acres. Facilities include electric furnaces, argon oxygen decarburization ("AOD") vessels, vacuum arc remelt and electro-slag remelt facilities, a blooming mill, billet mills, a billet/slab casting unit and hot rolled bar mills.

Chicago Works - Chicago, Illinois

The Chicago Works is located on the Calumet River and covers approximately 700 acres. Facilities include a coke battery, a blast furnace, bottom blown basic oxygen furnaces, electric furnaces, a blooming mill, billet mills, hot rolled bar mills and a wire mill.

(2) Steel Finishing Properties

In addition to the bar finishing operations located within the steel producing facilities, the Company's properties include hot rolled bar mills at the Cleveland Works and cold finish bar facilities at the following locations: Hammond and Gary, Indiana; Atco, New Jersey; Wilton, Iowa; Gulfport, Mississippi; Willimantic and East Hartford, Connecticut; Massillon and Youngstown, Ohio; Beaver Falls, Pennsylvania; and Hamilton, Ontario (Union Drawn Steel Company, Limited).

Tubular Products

The LTV Steel Company's properties include certain tubular facilities which are leased to the LTV Tubular Products Company. Included are the Campbell plant at Youngstown, Ohio, the seamless pipe mill at the Chicago Works, and the electric weld and continuous weld facilities located at the Aliquippa Works. The Campbell Plant covers approximately 370 acres along the Mahoning River and is the major seamless tube production and finishing facility. Other seamless mills are located within the Aliquippa Works and Indiana Harbor Works. These mills are supplied with rounds manufactured at the Aliquippa and Chicago Works and from third party purchases. Welded pipe and welded tube facilities are supplied with sheet steel from various Flat Roll Division plants.

Other

The Company owns all of the capital stock of the following six terminal switching railroad companies, all of which are common carriers subject to regulation by the Interstate Commerce Commission: Aliquippa and Southern Railroad Company, serving the Aliquippa Works; the Cuyahoga Valley Railway Company and the River Terminal Railway Company serving the Cleveland Works; the Mahoning Valley Railroad Company, serving the Campbell Plant; the Monongahela Connecting Railway Company, serving the Pittsburgh Works; the Chicago Short Line Railway, serving the Indiana Harbor Works.

During 1984, the Company's facilities operated at an average rate of approximately 54% of capability. Individual facilities are operated at rates which best serve the Company's overall need at the time and can be significantly higher or lower than the Company's average operating rate. LTV Steel does not believe data regarding the utilization of individual facilities are necessarily meaningful.

LTV Steel currently has certain facilities that are either temporarily idle or are operating well below their capacity. The Company's rationalization process also has resulted in charges, primarily noncash, and establishment of reserves for certain facilities. The facilities that are temporarily idled or operating below capacity have been responsible for substantial losses in the past three years and are expected to continue to incur losses until the market for these products improves. These facilities relate primarily to standby equipment or to departments that are expected to be returned to service or operated at higher levels as markets, price realization and related demand improve. Facilities which were maintained in an idled state during 1984 include coke batteries and a tubular seamless mill at the Indiana Harbor Works, a blooming mill, billet mill, hot strip mill and a tubular seamless mill at the Aliquippa Works, and coke batteries at Youngstown, Ohio and Birmingham, Alabama. Most of these facilities were built or acquired from the mid-1950's through 1979, were relined or rehabilitated in the 1970's, have been adequately maintained in productive condition and are available when needed to support product demand. Many of the facilities have been used for a substantial portion of their original estimated composite life.

Plants and equipment of the Company with a net book value of approximately $1.7 billion are pledged to secure mortgage indebtedness, which at December 31, 1984 totaled approximately $512 million.

Raw Materials

Iron Ore - The Company owns or leases directly or indirectly through joint ventures or partnerships the following iron ore properties:

1. The Northwest Ore Division - The Company leases two natural ore mines on the Mesabi Range in Minnesota.

2. Tilden Mining Company - The Company holds a 12% interest in the Tilden Mining Company, a joint venture which operates an iron ore pellet operation in Michigan.

3. Erie Mining Company - The Company holds a 35% interest in the Erie Mining Company, a partnership which operates an iron ore pellet operation in Minnesota.

4. Wabush Mines - The Company holds a 15.6% share of the Wabush Mines, a joint venture which operates an iron ore pellet operation in Canada.

5. Iron Ore Company of Canada - The Company holds a 12.58% interest in the Iron Ore Company of Canada, an iron ore pellet operation in Canada, and is required to take 15.38% of the pellet production from this operation.

6. Hibbing Taconite Company - The Company holds a 16.05% interest in the Hibbing Taconite Company, a joint venture which operates an iron ore pellet operation in Minnesota.

7. Reserve Mining Company - The Company holds a 50% interest in the Reserve Mining Company, a partnership, which operates an iron ore pellet operation in Minnesota.

8. Undeveloped Reserves - The Company owns a 75% interest in Biwabik, an undeveloped iron ore property in Minnesota and leases an idle reserve in Ontario, Canada which, if developed, would produce iron ore products. Essentially all undeveloped reserves are taconite requiring beneficiation. Undeveloped reserves would require the expenditure of substantial sums for development.

All the operating mines are open pit mines. The reserves are expected to be exhausted prior to the expiration dates of the various leases associated with the particular mining property. The Company is committed to pay its share of the annual cost of these operations either through cash advances or purchases of ore. For information relating to commitments and contingent liabilities of the Company incurred in connection with raw material operations, see the notes to the consolidated financial statements included herein.

The Company estimates that as of December 31, 1984, the total of its proven crude ore reserves and of its proportionate share of such reserves of the companies in which it has an ownership interest was such that, when mined and beneficiated, there could be produced for use by the Company approximately 792,335,000 gross tons (a gross ton is equivalent to 2,240 lbs.) of merchantable ore averaging approximately 64% iron content. These ore reserves are distributed as follows:

	Proven Net Interest in Reserves (1)	Iron Content	Annual Ore Entitlement	Share of 1984 Production(3)(7)	1984 Deliveries to Steel Plants (4)(7)
			(Gross tons	in thousands)	
Developed Properties:					
Northwest Ore Division	9,353	55%	1,200 (5)	695	574
Empire Iron Mining Partnership	-(8)	-	- (8)	2,179	2,191
Tilden Mining Co.	35,374	65%	1,200 (2)(6)		801
852					
Erie Mining Company	183,526	63%	3,850 (6)	1,619	1,630
Wabush Mines	51,789	64%	936 (6)	942	900
Iron Ore Co. of Canada	67,572	64%	2,460 (6)	690	577
Hibbing Taconite Co.	53,876	64%	1,300 (6)	377	802
Reserve Mining Company	178,799	64%	4,200 (6)	520	1,021
Total Developed Prop.	580,289		15,146	7,823	8,547
Undeveloped Properties:					
Minnesota-Biwabik	200,046	65%			
Ontario	12,000	66%			
Total Undeveloped Properties	212,046				
Total	792,335				

(1) The Company's ownership interest in reserves is stated in gross tons of concentrates or pellets.

(2) The Company's proportionate share includes 240,000 gross tons for Tilden which were purchased under an agreement the term of which is for the productive life of the mine.

(3) The Company's share of production for 1984 was reduced because the operations at the iron ore properties were curtailed and in some cases temporarily shut down as a result of inventory adjustments due to depressed demand for steel products.

(4) "Deliveries to Steel Plants" as related to "Share of 1984 Production" do not include sale of ore products to third parties.

(5) The entitlement is based on normal annual plant capacity. The production level is at the Company's discretion.

(6) LTV Steel can reduce its annual ore purchase requirements. Minimum ore purchase requirements, excluding purchases by Republic Steel prior to July 1, in 1984 totaled 6,337,000 gross tons for the Company's equity interest properties.

(7) "Share of 1984 Production" and "Deliveries to Steel Plants" exclude amounts applicable to Republic Steel Corporation for the first six months of 1984.

(8) J&L Empire, which owns 35% of Empire Iron Mining Partnership, was sold to LTV (Parent) effective December 18, 1984. Therefore, only amounts relating to "Share of 1984 Production" and 1984 "Deliveries to Steel Plants" are included in this table.

During 1984, the average blast furnace charge consisted of approximately 90% pellets and 10% sinter. The Company in 1984 received from its proportionate share of ore and pellets produced by companies in which it has an ownership interest, 7,128,000 gross tons of pellets and 695,000 gross tons of natural ore (mainly fines which are sintered before being charged to the blast furnace). During 1984, the Company purchased 16.1% of its pellet requirements from unaffiliated sources. Natural fines consumption came almost entirely from its own source of supply.

Metallurgical Coal - The Company owns (a) the Nemacolin Mines Corporation which operates one mine in Greene County, Pennsylvania, (b) the BCNR Mining Corporation which operates three leased coal properties located in Westmoreland, Washington and Allegheny Counties of Pennsylvania, (c) the Tuscaloosa Energy Corporation, which operates the Republic Mine, a leased coal property located in Pike County, Kentucky, (d) a 50% interest in the Beckley Coal Mining Company, which operates a leased coal property in Raleigh County, West Virginia, (e) a 53% interest in the Olga Coal Company, which operates a leased coal property in McDowell County, West Virginia, (f) a 50% interest in the Beatrice Pocahontas Company, which operates a leased coal property in Buchanan County, Virginia, (g) a 50% interest in the Knox Creek Coal Corporation, which operates a leased coal property in Buchanan County, Virginia, and (h) a 50% interest in the Knox Creek Carbon Company, which operates a leased coal property in Buchanan County, Virginia.

The majority of these mines are deep mines. The Company estimates that as of December 31, 1984, the total of the proven and probable reserves of metallurgical coal at its mines and its proportionate share of such reserves of the companies in which it has an ownership interest amounted to approximately 184,724,000 net tons,.as shown in the table below. The average sulfur content of the high volatile and low volatile metallurgical coal is 1.00% and .72%, respectively.

As of December 31, 1984 the Company owned, leased or had interests through associated companies in the following metallurgical coal reserves:

Net Interest in Metallurgical Coal

	Proven Reserves(1)	Probable Reserves(2)	Total Reserves	1984 Production
		(In Thousands)		
High Volatile Coal:				
Nemacolin Mines Corp.	3,426	-	3,426	415
BCNR Mining Corp.	14,007	1,827	15,834	226
Tuscaloosa Energy Corp.	3,746	2,011	5,757	79
Knox Creek Coal Corp.	8,896	10,927	19,823	146
Knox Creek Carbon Co.	35,137	20,002	55,139	285
Total High Volatile Coal	65,212	34,767	99,979	1,151
Low Volatile Coal:				
Beckley Coal Mining Co.	16,879	-	16,879	613
Olga Coal Company	20,983	20,169	41,152	415
Beatrice Pocahontas Co.	26,714	-	26,714	160
Total Low Volatile Coal	64,576	20,169	84,745	1,188
Total Coal	129,788	54,936	184,724	2,339

(1) Proven reserves: Coal reserves whose location, rank, quality and quantity are known from geologic evidence supported by engineering measurements.

(2) Probable reserves: Coal reserves whose location, rank, quality and quantity are based partly from sample analyses and measurements and partly from reasonable geologic projections.

The Company's share of production in 1984 from its associated metallurgical coal companies (exclusive of amounts applicable to Republic Steel Corporation for the first six months of 1984) totaled 1,151,000 net tons of high volatile clean coal and 1,188,000 net tons of low volatile clean coal.

Since 1980, the Company has sold its interest in several coal mines and undeveloped reserves. As part of the sales agreements, the Company was required as of December 31, 1984 to purchase approximately 28,818,000 net tons of high volatile coal over the next 16 years.

Metallurgical coal is used to make coke which is used in blast furnaces to make iron in the raw steel making process. During 1984, the Company produced all of its coke requirements, except for 378,000 net tons (7% of coke consumption) which were obtained through a tolling arrangement with a third party, with coal provided by the Company. The Company's proportionate share of metallurgical coal produced by its mines during 1984 represented approximately 26% of its high volatile and 100% of its low volatile metallurgical coal requirements. In 1984, approximately 51% of the Company's high volatile and 66% of its medium volatile metallurgical coal requirements were obtained through purchases under long-term agreements. The remainder of the high volatile (23%) and medium volatile (34%) coal was purchased from unaffiliated sources at spot market prices.

Other Raw Materials

The Company has a 37.5% interest in Black River Lime Company, a partnership which owns limestone properties and related facilities for the production of burnt lime in Carntown, Kentucky. The Company's share of Black River's proven reserves was approximately 93,617,000 gross tons as of December 31, 1984. The Company also has a 53.5% interest in Presque Isle Corporation which operates a limestone mine located in Michigan. The Company's share of Presque Isle Corporation's proven limestone reserves was approximately 165,443,000 gross tons as of December 31, 1984. The Company also owns a burnt lime processing plant at Grand River, Ohio which processes lime from Presque Isle and other sources into burnt lime. In 1984 approximately 71% of the 469,000 net tons of high calcite burnt lime consumed by the Company came from these sources (exclusive of amounts applicable to Republic for the first six months of 1984).

LTV Steel has various equity interests in oil and gas properties located in Ohio, West Virginia, Alabama and Pennsylvania. LTV Steel's share of the proven natural gas and oil equivalents reserves is 41.7 billion cubic feet. LTV Steel is negotiating an agreement to sell its interests in these oil and gas properties.

Substantially all other raw materials are purchased in the open market from domestic and foreign sources. Most of such raw materials, including nickel, tin, zinc, ferroalloys and scrap, are expected to continue to be in sufficient supply, although market prices have historically been subject to wide fluctuations.

Property Additions and Capital Expenditures

Capital expenditures (excluding property of Republic and other acquired businesses) and depreciation and amortization for the Company for the years indicated were as follows:

	1982	1983	1984
		(In Thousands)	
Capital Expenditures	$237,646	$220,352	$137,706
Depreciation and Amortization	$ 83,750	$ 87,765	$162,181

Note The Company's capital expenditure programs for 1982, 1983 and 1984 were mainly for equipment and facilities which are designed to reduce cost, increase production efficiency and improve quality and for environmental control projects. Spending for environmental control projects constructed during the three years 1982, 1983 and 1984, was $51,450,000, $18,365,000, and $36,500,000, respectively.

In October 1983 the Company commenced operation of its continuous slab caster at its Indiana Harbor Works. The caster, built during 1982 and 1983 at a cost of approximately $190 million, reached capacity in mid-1984, which enabled the Company, when operating at full capacity, to continuously cast approximately 31% of its total steel production.

Further, in June 1983 the Company completed the modernization of its large-diameter seamless pipe mill at its Campbell plant at a total cost of approximately $80 million. The project is designed to significantly improve quality and productivity.

The Company's operations are subject to a number of environmental laws and regulations. LTV Steel currently estimates that its consolidated capital expenditures for environmental control projects will be approximately $25 million in 1985 and average $17 million per year for the period 1985 through 1987. See "Item 3. Legal Proceedings - Environmental Control Matters" for further information regarding environmental control matters. In addition to future capital expenditures for environmental control projects, the Company has and will incur substantial increased operating and maintenance expenses as a result of environmental laws and regulations.

ITEM 3. LEGAL PROCEEDINGS

Environmental Control Matters

General

The Company is subject to a number of federal statutes concerning environmental matters, including the Clean Air Act ("CAA"), the Federal Water Pollution Control Act ("FWPCA"), the Surface Mining Control and Reclamation Act of 1977 ("SMCRA"), the Resource Conservation and Recovery Act of 1976, as amended ("RCRA"), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and the Toxic Substances Control Act ("TSCA"). The Company also is subject to similar laws of various states and a number of local governmental entities. These laws in large part implement the federal statutes and in a number of instances impose obligations in addition to or more stringent than federal requirements. Pursuant to these statutes and laws, regulations affecting the environmental activities of the Company have been or are being promulgated. The capital requirements and operating costs associated with implementation of these statutes, laws and regulations to the Company have not been determined in all cases, but the capital requirements and operating costs which will have to be incurred in addition to those specifically discussed below are expected to be substantial.

The Company, as co-petitioner with the American Iron and Steel Institute ("AISI"), other trade associations and other steel and coal producing companies, has from time to time instituted appeal proceedings in various Federal and state courts and administrative agencies, seeking to review, revise or set aside certain standards, regulations, programs or policies pertaining to environmental quality control which have been adopted by various Federal, state or local governmental agencies and which the Company believes are arbitrary, unreasonable or otherwise unlawful.

Legal and administrative actions have been taken or are being threatened against the Company, as discussed below, by the United States Environmental Protection Agency ("U.S. EPA") and certain state and local environmental agencies for alleged violations of various federal, state and local environmental laws and regulations. An agreement with the U.S. EPA and the U.S. Justice Department ("Environmental Agreement"), which was incorporated into consent decrees entered in the U. S. District Courts for the Western District of Pennsylvania, the Northern District of Ohio, and the Northern District of Indiana during 1981, settled a number of environmental actions which previously had been pending against J&L Steel and imposed substantial environmental control capital expenditure requirements which are now binding upon the Company and are designed to satisfy essentially all of the air and most of the water quality requirements at the Aliquippa, Pittsburgh, Cleveland, Campbell and Indiana Harbor Works.

The Environmental Agreement provides for the construction of the following major projects at the locations indicated (substantially all of which has been completed):

- Aliquippa Works - air quality control projects at the coke plant, the blast furnaces, the basic oxygen furnace shop and boilers; and water quality control projects at the seamless mills, blast furnaces, basic oxygen furnace shop, hot forming mills, chemical rinse treatment plant and boilers;

- Pittsburgh Works - air quality control projects at the coke plant, electric furnace shop and boilers; and water quality control projects at the coke plant, blooming mill and bar mills;

- Cleveland Works - air quality control projects at the electric furnace shop, the basic oxygen furnace shop and the blast furnaces;

- Campbell Finishing Plant Facility - air and water quality control projects at the coke plant (permanently shut down); and water quality control projects at the seamless mills; and

- Indiana Harbor Works - air quality control projects at the coke plant (temporarily shut down), the basic oxygen furnace shop and the blast furnaces.

Pursuant to the Steel Industry Compliance Extension Act of 1981 ("SICEA"), J&L Steel had sought the approval of the U.S. EPA to defer the expenditure of approximately $45 to $65 million required by the Environmental Agreement. Pending a decision on its application for deferral pursuant to SICEA, J&L Steel deferred work on the projects which were the subject of the deferral application, and a number of scheduled compliance dates specified in the Environmental Agreement had not been met.

In January 1983, U.S. EPA denied the application for deferral under SICEA on the basis that J&L Steel was in violation of the above-mentioned consent decrees, and, shortly thereafter, the U. S. Department of Justice filed motions with the above-mentioned U. S. District Courts seeking contempt orders and aggregate fines for alleged past violations of the consent decrees in an aggregate amount of over $108 million (as of November 30, 1982), together with additional fines for future violations of the decrees as they accrue. The Company is subject to minimum penalties of $5,000 or $7,500, depending on the type of deadline, per day of delinquency per violation, and thus if alleged violations are found to exist and civil penalties are assessed, penalties accruing in the future in the aggregate could also be substantial in amount. In addition, penalties could be imposed pursuant to Section 120 of the CAA equivalent to the economic benefit derived from failing to comply with CAA requirements. However, Section 120 penalties do not begin to accrue until notification is issued by the U.S. EPA, and the Company has not been notified.

The Company is contesting the U.S. EPA's request for civil penalties on the basis that (i) there have been no violations of the consent decrees because of force majeure and other reasons, (ii) the asserted violations, even if proven, are de minimis and should not result in the award of substantial civil penalties and (iii) the motions for civil penalties should be denied because they are based primarily on the Company's alleged failure to comply with deadlines which would have been extended had its deferral application not been wrongfully rejected by the U.S. EPA. All projects covered by the consent decrees which had previously been deferred by the Company (except those for manufacturing facilities which have been shut down) are now completed or under way.

With respect to the Company's third assertion (wrongful denial of its deferral application), the Company has filed in the above-mentioned U.S. District Courts in Pennsylvania, Ohio and Indiana complaints against the U.S. EPA and its Administrator seeking orders which would reverse the findings and action of the U.S. EPA which denied the deferral application and modify the three consent decrees so as to, in effect, approve the Company's deferral of expenditures. The complaints assert that in denying the application for deferral the U.S. EPA reached an incorrect result which ignored both the letter and spirit of the Act.

An agreement has been reached among LTV, the Company, the U.S. EPA and the U.S. Department of Justice (the "Agreement") which would settle all of the foregoing litigation. The Agreement requires a payment by LTV of $4 million in cash penalties and requires LTV and the Company to undertake certain penalty projects at an approximate aggregate cost of $30 million. The $4 million fine was accrued as of December 31, 1983. The Agreement was approved by the U.S. District Courts in Indiana and Pennsylvania which exercised jurisdiction over the proceedings. The U. S. District Court in Ohio, however, has declined to approve the agreement unless $500,000 is paid to the City of Cleveland as part of any consent decree in this action. The Company has substantially completed all of the capital improvements which are required under the Environmental Agreement and has recommended to the government that the $500,000 payment to the City of Cleveland be made from the $4 million fine.

Specific Proceedings

On May 11, 1977, Pennsylvania Department of Environmental Resources ("DER") issued a notice of violation for J&L Steel's solid waste disposal area at the Aliquippa Works. The Company and DER are negotiating a consent decree which will both resolve cited violations and authorize certain changes in the disposal area required by RCRA and Pennsylvania's Solid Waste Management Act of 1980. The Company has taken the position in its continuing negotiations with DER that the steel group is in compliance with all applicable federal and state laws.

In August 1974, J&L Steel agreed, in settlement of litigation brought by Illinois environmental authorities, to install certain water discharge control facilities at its Indiana Harbor plant (including facilities covered under a previous agreement with Indiana authorities) by various dates extending to 1982. The settlement left open the possibility of future litigation with respect to further control of effluents from coke plant facilities, although no such litigation is presently threatened. In November 1976, pursuant to stipulation among the parties in an adjudicatory hearing requested by J&L Steel, a revised permit under the NPDES was issued covering effluent discharges from the Indiana Harbor Works. A substantial portion of the work called for by the settlement agreement has been completed; however, LTV has notified the Illinois environmental authorities that the remaining work is unnecessary because the steel group is in compliance with federal law requirements.

In July 1978, Nemacolin Mines Corporation (now a part of the Company) filed with the Pennsylvania Environmental Hearing Board a notice of appeal from the action of DER in denying an application for industrial waste and coal refuse disposal permits at the Nemacolin Mine in Waynesburg, Pennsylvania. On June 26, 1979, DER filed with the Board a complaint for civil penalties against the Buckeye Coal Company (now a part of the Company) and Nemacolin Mines Corporation. The complaint contains 68 separate counts, each requesting that the Board assess civil penalties against Nemacolin in the maximum amount authorized by law for each day of violation. A settlement agreement has been reached between LTV Steel and DER which requires LTV Steel to undertake certain penalty projects at a cost of approximately $200,000. The settlement agreement is subject to approval by the Pennsylvania Environmental Hearing Board.

In December 1982, Keystone Bituminous Coal Association, of which J&L Steel is a member, filed an action in the U.S. District Court for the Western District of Pennsylvania challenging the constitutionality of the Pennsylvania Mine Subsidence Act and DER regulations thereunder. In July, 1984 the District Court upheld the constitutionality of the Act and the regulations. The Plaintiffs have appealed the decision to the U. S. Court of Appeals for the Third Circuit.

From time to time since March 3, 1977, the Company has received notices from the Illinois EPA alleging that apparent violations at one or more of the Company's Chicago facilities have been observed or have been inferred based on various calculations and assumptions. As a result of these alleged violations, operating permits for certain of the Company's facilities, including its electric arc furnaces, and a renewal of an operating permit for its blast furnace had not been issued. On July 8, 1980, the Company was formally notified by the Illinois EPA that operating permits for the electric furnace shop and the reladling station in the melt shop at the Company's Chicago facilities had been denied. On February 18, 1981 and August 26, 1981, the Company received similar formal notifications with respect to the operating permits for the 44-inch mill scarfing machine and the No. 1 bottom blown basic oxygen ("Q-BOP") furnace, respectively, at its Chicago facilities. The Company appealed all of these Illinois EPA actions to the Illinois Pollution Control Board. In an attempt to resolve these appeals, the Company submitted to the Illinois EPA an application to operate the blast furnace, No. 1 and No. 2 Q-BOP furnaces and 44-inch mill scarfing machine at the Chicago District under an alternate control strategy ("ACS") commonly referred to as a "bubble" strategy. On March 16, 1982, the ACS application was denied by the Illinois EPA and on April 20, 1982, the Company appealed that denial to the Illinois Pollution Control Board. Thereafter, operating permits for the electric furnace shop, reladling station and No. 1 Q-BOP furnace were issued and a temporary variance to operate the 44-inch mill scarfing machine was granted while an application to modify applicable regulations is processed. All other appeals are pending.

On February 5, 1980, the United States filed a suit against the Company in the United States District Court for the Northern District of Illinois seeking to finalize a proposed Consent Order which had been previously agreed upon by the Company and the U.S. EPA to resolve certain assertions made by the U.S. EPA in a notice of violation which it issued to the Company on December 2, 1977. The proposed Consent Order was approved by the Court on December 12, 1980, and covered, among other of the Company's Chicago facilities, the blast furnace casthouse. The Consent Order required the installation of certain air pollution control equipment at the casthouse in the event that the Company could not demonstrate by testing that its casthouse was in compliance with applicable air pollution regulations governing the emission of total suspended particulates. The Company conducted two sets of tests in cooperation with the U.S. EPA which demonstrated that the casthouse is in compliance with the law. The U.S. EPA disapproved the two tests because of a dispute over test methods. Despite its demonstration of compliance, the Company installed additional alternative controls of the general type approved by the U.S. EPA. Additional testing indicated that these new controls further reduced emissions below allowable limits. After lengthy negotiations to resolve the dispute failed, on March 24, 1983, the Company filed a Petition with the Court seeking a determination that the Company is in compliance with the provisions of the Consent Order. On April 19, 1983, the U.S. EPA simultaneously filed its Answer to the Petition and a separate Motion to enforce the terms of the Consent Order. An agreement in principle has been reached between LTV Steel and the U. S. EPA which requires LTV Steel to install pollution control equipment at the plant at a cost of approximately $175,000 and pay a cash penalty of $250,000 (which was fully accrued at December 31, 1984).

On October 29, 1981, the Company appealed to the Cleveland Board of Building Standards and Appeals from an adverse determination of the Commissioner of Air Pollution Control for the City of Cleveland dated September 28, 1981 denying certain variances from applicable ordinances of the City of Cleveland relating to sulfur emissions from the boilers at its Cleveland District operations. The appeal is pending.

On June 30, 1982, the U.S. EPA filed a civil complaint against the Company in the United States District Court for the Northern District of Ohio alleging that blast furnaces Nos. 1, 4, 5 and 6 at the Company's Cleveland plant were being operated in violation of certain air pollution control regulations of the State of Ohio. On August 16, 1983, the U.S. EPA filed a motion to amend the civil complaint to add two claims for relief alleging that the basic oxygen furnace (BOF) shop at the Cleveland plant was also being operated in violation of certain air pollution control regulations of the State of Ohio. In addition to injunctive relief, including the installation of pollution control equipment, the amended complaint sought civil penalties of an unspecified amount. Later, the City of Cleveland intervened as a plaintiff. An agreement in principle has been reached among LTV Steel, the City of Cleveland and the U. S. EPA which requires LTV Steel to install pollution control equipment on the operating blast furnaces at a cost of approximately $500,000 for each furnace and pay a cash penalty of $250,000 (which was fully accrued at December 31, 1984).

On March 28, 1983 the Company filed an appeal before the Board of Building Standards and Appeals of the City of Cleveland from the issuance of 14 operating permits issued by the City of Cleveland for certain facilities at the Company's Cleveland facilities. On March 30, 1983, the Company filed an appeal before the Ohio Environmental Board of Review to contest the validity of operating permits issued by the Ohio EPA for the same 14 facilities. The 14 facilities include 12 soaking pit furnaces at the 44" and 45" mills and two reheat furnaces at the 10" and 12" bar mills. Both the City and State permits contained an unreasonably burdensome requirement to use only desulphurized coke plant gas as a fuel for the soaking pit and reheat furnaces. Both appeals were resolved when the Ohio EPA and the City of Cleveland issued permits which modified this requirement in an acceptable manner.

The U.S. EPA filed a complaint against the Company on December 7, 1978 in the United States District Court for the Northern District of Ohio alleging that certain of the Company's Mahoning Valley District facilities were in violation of emission regulations of the Ohio Implementation Plan and sought injunction relief and civil penalities for the alleged violations. The State of Ohio and the Pennsylvania Department of Environmental Resources intervened as plaintiffs. On March 1, 1979, this action was settled by the entry of a Consent Order signed by all of the above parties. In January 1980, the Company requested that the U.S. EPA, Ohio and Pennsylvania reopen negotiations for the purpose of modifying the March 1, 1979 Order. An amended Consent Order ("Amended Order"), which modified the March 1, 1979 Order, was approved by the Company, the U.S. EPA, the Commonwealth of Pennsylvania and the State of Ohio. As required by the terms of the Amended Order, the three blast furnaces and one of the three coke batteries at the Company's Mahoning facilities located in Youngstown, Ohio were closed by December 31, 1982. Although the Company believed that all facilities which are subject to the March 1, 1979 Order were in compliance with applicable standards, the U.S. EPA informally advised Republic that it would seek to obtain substantial penalties for alleged past violations of the March 1, 1979 Order. Such penalties, together with further modifications of the March 1, 1979 Order necessitated by the passage of time and changed circumstances, were discussed with the U.S. EPA and the Department of Justice but did not produce agreement. On May 1, 1983 the Company filed a motion with the Court to modify the March 1, 1979 Consent Order. On June 3, 1983, the U.S. EPA filed a Motion to enforce the terms of the Consent Order and a Response to the Company's Motion. In its Response and Motion, the U.S. EPA alleges that the Company is in violation of certain provisions of the Consent Order relating to the emission of sulfur compounds from the Warren coke battery and seeks stipulated penalties of $7,500 per day for each day of violation. The Company's Motion and the U.S. EPA's Motion are both pending. On March 19, 1984 the Department of Justice notified Republic that the Company has failed to comply with a provision in the Consent Order relating to the treatment of coke plant wastewaters and demanded payment of $6,067,500 in stipulated penalties for such violation and an additional $7,500 per day in stipulated penalties for each day the violation continues. An agreement in principle has been reached between LTV Steel and the U. S. EPA which requires LTV Steel to install pollution control improvements for the desulphurizer at a cost of approximately $750,000, to construct a water discharge treatment facility for the coke plant at a cost of approximately $500,000, undertake penalty projects in the amount of approximately $2,500,000 and pay a cash penalty of $500,000 (which was fully accrued at December 31, 1984). In the event the water discharge treatment facility proves inadequate, the agreement in principle requires LTV Steel to install further treatment facilities.

On July 21, 1983 the Company filed an appeal before the Board of Building Standards and Appeals of the City of Cleveland from the issuance by the Cleveland Commissioner of Air Pollution Control on June 24, 1983 of two permits-to-install air pollution control equipment for blast furnaces Nos. 5 and 6 at the Company's Cleveland plant. Both permits contain unreasonably burdensome requirements relating to the submission of an operating and maintenance plan for the control equipment being installed under the permits. While the appeal is still pending, it is expected to be resolved as a result of the agreement in principle that was reached to settle the litigation filed against the Company by the U.S. EPA on June 30, 1982 (discussed above).

On September 8, 1983 the Company filed an Appeal before the Board of the Building Standards and Building Appeals of the City of Cleveland from the denial on August 9, 1983, by the Cleveland Commissioner of Air Pollution Control of a variance from certain air pollution control regulations of the City of Cleveland pertaining to the basic oxygen furnaces at the Cleveland plant. The denial of a variance was made during a period of time when certain existing air pollution control equipment was undergoing repair work and a conversion to baghouses. The appeal was resolved when the issue became moot upon completion of the repair and other work on the existing air pollution control equipment.

Civil Rights Matters

There are pending in court, or with various administrative agencies, other proceedings involving LTV relating to civil rights matters, none of which individually or in the aggregate, in the opinion of LTV would, if decided adversely, have a significant effect on the financial condition or results of operations of LTV.

Other Matters

An ex-employee of Jones & Laughlin Steel Corporation (now a part of LTV Steel) has commenced three actions in the Court of Common Pleas of Allegheny County on behalf of holders of Jones & Laughlin Steel Corporation's Series A Preferred Stock, which class of securities was retired in 1981. One action filed in October 1980 is against LTV, Jones & Laughlin Steel Corporation and the directors and certain of the officers of the Jones & Laughlin Steel Corporation, alleging a conspiracy to lower the price of shares of such Series A Preferred Stock and otherwise harm the holders of such shares. Various types of injunctive relief are sought including the appointment of an independent director and special investigator to protect the holders of such shares. A second petition filed on December 30, 1980 seeks the involuntary dissolution of Jones & Laughlin Steel Corporation and liquidation of its assets, and recovery to holders of the Series A Preferred Stock of the amount allowable by law up to $100 per share. A third action, which was filed in May 1981 against LTV, Jones & Laughlin Steel Corporation, and certain directors and officers of LTV and Jones &

Laughlin Steel Corporation on behalf of the holders of the Series A Preferred Stock, alleges that the defendants conspired with each other and intentionally failed to comply with the requirements of the Pennsylvania Business Corporation Law and the Jones & Laughlin Steel Corporation's By-Laws so as to mislead such shareholders and the public as to the actual economic condition of Jones & Laughlin Steel Corporation and the actual value of the Series A Preferred Stock. These cases are in various stages of pre-trial proceedings.

PART II

ITEM 5. MARKET FOR THE REGISTRANT'S COMMON STOCK AND RELATED SECURITY HOLDER MATTERS.

LTV Steel is 100% owned by LTV.

For information on cash dividends paid by LTV Steel and its predecessors on its common stock to LTV during the past three years, see "Item 8. Financial Statements and Supplementary Data." Under its Bank Credit Agreement and its Indentures, LTV Steel is restricted in its present and future ability to pay dividends based on a percentage of earnings, subsequent to a specified point in time and also on maintenance of other factors of financial conditions, including working capital and net worth. See page F-15 of the notes to the consolidated financial statements. LTV Steel does not pay dividends on a regular basis and there is no set dividend policy.

ITEM 6. SELECTED FINANCIAL DATA.

The following selected financial data should be read in conjunction with the "Item 7. Management's Discussion and Analysis of Results of Operations" and the related consolidated financial statements and notes thereto included elsewhere herein.

	1984	1983	1982	1981	1980
			(in thousands)		
Operating information for the year:					
Net sales	$4,010,663	$2,788,510	$3,039,445	$4,785,393	$3,800,235
Income (loss) from continuing operations	(488,223)	(236,898)	(306,322)	274,513	33,782
Dividends -					
Preferred	-	-	-	285	570
Common	-	-	15,000	120,122	15,000
Financial position at year end:					
Working capital (deficit)	$ (325,497)	$ 36,076	$ 35,607	$ 279,636	$ 201,029
Net property, plant and equipment	3,251,274	1,730,370	1,669,665	1,564,028	1,425,548
Total assets	4,495,934	3,167,666	3,074,802	3,377,220	3,207,819
Short-term debt (including current maturities)	122,026	40,957	19,151	10,316	12,342
Long-term debt	1,133,054	722,087	668,580	539,538	569,064
Long-term advances from The LTV Corporation	6,695	367,708	65,642	-	-
Total shareholder's equity	1,628,906	969,665	1,264,195	1,593,897	1,261,160

Note - The above data include the accounts and results of Jones & Laughlin Steel Incorporated and since July 1, 1984 the steel operations of Republic Steel Corporation. Effective as of March 30, 1984, LTV Steel sold its energy products business segment to its parent, The LTV Corporation, and, accordingly, accounted for the disposition as a discontinued segment. Therefore, data for 1980 through 1983 have been reclassified to exclude accounts and results of the energy products business segment from the above information, except for the investment which has been included in the line "Total Assets".

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF RESULTS OF OPERATIONS.

LTV Steel Company, Inc. (LTV Steel) is a wholly-owned subsidiary of The LTV Corporation (LTV). On June 29, 1984, LTV acquired (in a "purchase" transaction) Republic Steel Corporation (Republic) through an exchange of capital stock, whereby Republic became a wholly-owned subsidiary of LTV. On December 19, 1984, LTV Steel was formed by combining the operations of Jones & Laughlin Steel Incorporated (J&L Steel) with the steel operations of Republic. J&L Steel and Republic were wholly-owned subsidiaries of LTV, therefore, the combination of the two affiliated companies was accomplished by combining the balance sheet accounts of the respective companies as of July 1, 1984. The consolidated results of the Company include the combined operations of J&L Steel and, since July 1, 1984 (the effective date of the transaction for accounting purposes), the ongoing steel operations of Republic.

The consolidated statement of operations for each of the three years ended December 31, 1984 is included on page F-3 elsewhere herein under Item 8. Operating results of the energy products business segment, which was sold as of March 30, 1984 to LTV, have been reclassified as discontinued operations in the consolidated statement of operations. This discussion and analysis of results of operations should be read in conjunction with the financial data in the following table and with the consolidated financial statements and the accompanying notes thereto.

	1984	1983	1982
Net sales	$4,010,663	$2,788,510	$3,039,445
Operating loss	$ (398,751)	$ (215,840)	$ (298,888)
Interest and debt discount	(161,699)	(81,055)	(58,496)
Corporate income, net	61,309	54,145	40,847
Income tax credit	10,918	5,852	10,215
Loss from continuing operations	(488,223)	(236,898)	(306,322)
Income (loss) from discontinued operations	56,723	(57,632)	(8,342)
Net loss	$ (431,500)	$ (294,530)	$ (314,664)

1984 compared with 1983

Results of Operations

Sales of $4.0 billion for 1984 increased by $1.2 billion (44%) from 1983 sales of $2.8 billion and shipments of 7.7 million tons of steel products increased by 2,001,000 tons from shipments of 5.7 million tons in 1983. These increases were primarily due to the inclusion of sales and shipments of Republic following its acquisition by LTV on June 29, 1984 and to the increased demand and sales, during the first six months of 1984, for most steel products, partially offset by decreased demand during the second half of the year. The most significant increases in sales and shipments occurred in flat rolled products for shipment to the automotive, steel service center and converter markets and in bar products for the automotive, electrical, agricultural and other machinery and converter markets. Selling prices and shipments, as well as orders continued to be adversely affected by the high level of steel imports which accounted for 27% of apparent domestic supply in 1984, compared with 21% in 1983. Price realization continues to be inadequate and shipments remain depressed because of the continuing high level of imports and the overall low demand for steel products, including the low levels of production and shipment of tubular products to the oil and gas industry. The average operating rate of the Company's steel plants during 1984 was 54% compared with 57% during 1983. Raw steel production increased to 9.3 million tons in 1984 compared with 7.5 million tons in 1983. The increase in production resulted primarily from the addition of Republic offset in part by shipments of steel products from inventory.

The operating losses were $398.8 million in 1984 and $215.8 million in 1983. The operating loss is the loss from continuing operations before general corporate income or expense, interest expense or income and income taxes. The operating losses resulted principally from competitive price pressures, continuing lower than normal shipping levels, inadequate price realizations and production and shipments of lower priced products. During the first six months of 1984, these factors resulted in an operating loss of $50.8 million. This represented an improvement of $86.7 million from the $137.5 million loss in the first half of 1983. The improved operating performance was due to the higher levels of shipments and production, improved sales realization in some flat rolled products and continuing cost reduction and productivity improvement programs. During the last six months of 1984, the operating loss of $348.0 million was $269.7 million worse than the loss of $78.3 million in the second half of 1983 as steel imports reached record levels. Due to the above factors, the losses that were incurred in the fourth quarter have continued into the 1985 first quarter. The second half of 1984 loss included special charges, primarily noncash, of $162.0 million related principally to facility consolidations and rationalization and staff reductions brought about by the Republic combination. The special charges resulted from the Company's efforts following the Republic combination to concentrate steelmaking in the most efficient facilities and to make effective use of capital already employed. As a part of the rationalization, the Company determined that the remaining economic useful lives of certain steelmaking assets had been shortened and therefore increased depreciation expense by $17.8 million as part of the special charges. Other major expense items included in the second half of 1984 were cost penalties resulting from the idling of certain coal operations in order to reduce inventories built earlier in the year as a hedge against a possible mine workers' strike, expenses related to a basic oxygen furnace precipitator explosion at the Indiana Harbor Works and a higher level of fixed costs per unit of production which resulted when operating levels were reduced to implement a cash-generating inventory reduction program.

As a result of operating at lower than normal activity levels, the noncash depreciation charge was reduced from the computed straight-line amount by $44.0 million and $43.4 million in 1984 and 1983, respectively. The depreciation policies are described in the notes to consolidated financial statements. The 1983 results included a liquidation of LIFO inventory quantities, carried as though acquired at lower costs that prevailed in prior years, which decreased cost of products sold by $8.0 million. There was no such credit in 1984. In 1984, there was a reduction of $20.0 million in pension expense primarily from the net effect of the changes in the actuarial assumptions for the interest rate and salary scale. There will be a continuing favorable effect on future periods from this change.

While benefits of combining the steel operations of the former J&L Steel and Republic are beginning to be realized, operating results of the combined units are not expected to improve substantially until shipments and price realizations increase above current levels. Benefits during the latter part of 1984 were realized principally from salary force reductions, operating the two Cleveland plants as a more efficient facility, raw materials sourcing and optimizing operations by concentrating steelmaking in the most efficient facilities.

Interest and Debt Discount Expense

Interest and debt discount expense increased to $161.7 million in 1984 from $81.1 million in 1983 due to the debt assumed in the Republic combination, increased average outstanding long-term interest-bearing advances from LTV to finance the Company's operating and capital expenditure requirements and higher interest rates and because of finance fees paid to LTV Sales Finance.

Corporate Income, Net

Corporate income increased by $7.2 million in 1984 to $61.3 million compared with $54.1 million in 1983, due primarily to the $32.5 million gain on the sale of certain net assets of the tubular products finishing plants to LTV Tubular Products Company, an affiliate. The year 1984 also included interest income of $22.7 million from LTV Energy Products notes receivable which had previously been non-interest bearing and from management fees of $9.3 million which were charged to affiliates. The year 1983 included a $22.0 million gain on the sale of the stainless steel finishing operations to LTV Specialty Steels, Inc., and $32.8 million from sales of tax benefits.

Income Taxes

Income taxes do not approximate the U.S. Federal statutory income tax rate due to the application of the Company's Federal income tax agreement with LTV. For additional information regarding income taxes, see the notes to consolidated financial statements.

Discontinued Operations

On April 23, 1984, the Company finalized the sale of its 91% interest in LTV Energy Products Company to LTV. The sale of the Energy Products business segment was effective as of March 30, 1984. Operating results of the discontinued segment for the first three months in 1984 have been reported as discontinued operations and the consolidated financial statements have been reclassified to exclude individual balance sheet accounts, except for the investment, as well as sales, costs and expenses for the years prior to 1984.

1983 compared with 1982

Results of Operations

Sales for 1983 decreased by $251.0 million (8%) to $2.8 billion compared with 1982. The decline in sales was due primarily to a 55% decrease in tons shipped of higher-priced tubular products used by the oil and gas industry (a $516.0 million decrease in sales), due to the mid-1983 sale of stainless steel facilities to an affiliate and due to the overall low level of selling prices. A 21% increase in tons shipped of lower-priced flat rolled products used primarily in the automotive and other consumer durable goods markets more than offset the decrease in tubular shipments. However, the sales increase from flat rolled products was not sufficient to offset the overall lower selling prices and the decrease in tubuler sales. Steel shipments continued to be adversely affected by steel imports which accounted for approximately 21% of apparent domestic supply in 1983 compared with 22% in 1982. Total shipments of all steel products aggregated 5.7 million tons in 1983, an increase of 567,000 tons over 1982. Shipments of tubular products remained at the extremely depressed levels experienced since early 1982 when demand decreased substantially because of reduced U.S. oil and gas drilling activity and because of reduced customers' purchases as they reduced their high levels of inventory accumulated during 1981 and the first part of 1982. Raw steel production increased 15% to 7.5 million tons in 1983 as the average operating rate at the steel plants during 1983 increased to 57% compared with 50% for 1982. As a result of market conditions and reduced demand for products, the steel facilities operated at lower than normal levels, and in 1983 and 1982 the noncash charge for depreciation was reduced from the computed straight-line amounts by $43.4 million and $46.5 million, respectively. These amounts were computed in accordance with the modified straight-line method of depreciation as described in the notes to consolidated financial statements.

The operating losses of $215.8 million in 1983 and $298.9 million in 1982 were incurred primarily because of the low volume of shipments and production. In addition, severe competition and low demand led to decreased selling prices for many products. The low 1983 volumes resulted primarily from minimal shipments and production levels for tubular products, and from the low level of shipments of bar products and light structurals. Operating income from flat rolled products partially offsets the losses from these product lines. Operating results improved during 1983 from an operating loss of $86.7 million in the first quarter to an operating loss of $51.3 million in the fourth quarter due to increased shipments of flat rolled products to the automotive and other consumer durable markets, a higher operating rate and continuing cost reduction and productivity improvement programs. Cost reduction programs included permanent reductions in the salaried work force and in fringe benefits, which lowered production and overhead costs as well as selling, general and administrative expenses. Hourly fringe benefit costs also decreased between periods as a result of changes contained in the United Steel Workers contract which was entered into on March 1, 1983. Concessions granted the U.S. steel industry in the USW contract included an immediate cut in base hourly wages of $1.25 per hour, or approximately 9%, and an elimination of cost of living adjustments until August 1984, with any adjustments thereafter on a reduced basis. The 1983 results included a liquidation of LIFO inventory quantities, carried as though acquired at lower costs which prevailed in earlier years, which decreased cost of products sold by $8.0 million compared with $42.0 million in 1982. The fourth quarter of 1982 included a special charge of $30.0 million, principally for facility consolidations.

Interest and Debt Discount Expense

Interest and debt discount expense increased to $81.1 million in 1983 from $58.5 million in 1982 primarily due to the December 1982 borrowings under the Company's revolving bank credit agreements, debt incurred in connection with capital expenditure and acquisition financings and increased long-term advances from LTV.

Corporate Income, Net

Corporate income increased by $13.3 million in 1983 to $54.1 million compared with 1982, due primarily to the $22.0 million gain on the sale of the stainless steel finishing operations to LTV Specialty Steels, Inc. (Specialty), an affiliate. The effect of the 1983 gain on sale of Specialty was partially offset by decreases in income from sales of tax benefits and decreases in gains from debt retirement.

Income Taxes

Income taxes do not approximate the U. S. Federal statutory income tax rate due to the application of the Company's Federal income tax agreement with LTV. For additional information regarding income taxes, see the notes to consolidated financial statements.

Discontinued Operations

Discontinued operations result from the Company's sale of its 91% interest in LTV Energy Products Company to LTV as of March 30, 1984.

Discussion of Effects of Inflation

For information regarding the effects of inflation on the Company's consolidated operations, earnings and financial position, see the notes to consolidated financial statements.

FINANCIAL CONDITION, CAPITAL RESOURCES AND LIQUIDITY

During 1984, the current ratio decreased to 0.74-to-one from 1.04-to-one at December 31, 1983, and working capital decreased by $361.6 million to a deficit of $325.5 million. Funds that were used for operations, for reductions of long-term advances from LTV of $491.9 million (including $130.9 million assumed in the combination with Republic), for net reductions in other long-term debt of $178.8 million (including $100.0 million of bank debt) and for property additions exceeded funds generated by the sale of the energy products and tubular products businesses (to LTV), the sale of affiliated companies, by the combination of J&L Steel and Republic, and by the pay off of the energy products notes.

A major portion of 1984's working capital usage was caused by the net loss. The return to profitability and to positive cash flow by the Company is dependent upon several factors, including the level of imports of foreign steel and steel products (including imported automobiles), demand for domestic steel and steel products (including the automotive, oilfield tubular and capital goods markets), pricing and competitive pressures from specialized nonintegrated steel producers.

During early 1984, the Company terminated its separate bank credit agreement, and, along with other LTV subsidiaries, now has an agreement with LTV Sales Finance Company, a wholly-owned subsidiary of LTV. At December 31, 1984, the Company had borrowings of $171 million under this arrangement and could borrow up to a total of $350 million - see notes to the accompanying financial statements included elsewhere herein.

The Company's capital expenditure budget for 1985 has been reduced to approximately $141 million. Budgeted expenditures are for normal, recurring improvement projects related to steelmaking capacity and for general improvement and required environmental projects. Equipment and facilities that otherwise would have required capital expenditures will be replaced where possible by existing duplicative assets resulting from the Republic combination.

Until recent years, the Company has been able to generate sufficient funds from operations and external sources. During 1983 and a portion of 1984, however, the Company was heavily dependent upon LTV for much of its cash requirements. In late 1984, the Company was able to repay its advances from LTV through sales of businesses and by applying the notes receivable from its former energy products subsidiary to such advances. At December 31, 1984, the Company had a minimal amount of advances from LTV, compared with $368 million at December 31, 1983.

The management of LTV Steel believes that bringing the steel operations of J&L and Republic under common control to form LTV Steel has formed a more efficient steel operation with lower per unit operating costs, lower combined capital expenditure requirements and improved operating cash flow. In addition, the merger is permitting the reduction of the combined steel operation's investment in working capital, continued elimination of duplicative personnel and related costs, and the sale of certain nonstrategic assets. Some of the benefits of combining the steel operations of J&L and Republic are beginning to be realized; however the total anticipated benefits and the timing of their full realization has been delayed, in part, because of the extremely adverse business conditions under which the combined steel operations have had to operate. Operating results of the combined steel units are not expected to sufficiently improve until the merger benefits are more fully realized and/or until shipments and price realizations improve from current levels. Much of this improvement will depend on realization of the President's proposals to limit steel imports. The anticipated operating efficiencies and other benefits associated with the combination and the expected benefits from the President's steel import programs are expected to result in increased cash flow to LTV Steel.

The anticipated improvements (the President's program, benefits of the combination and others) are expected to increase the Company's cash flow and to reduce the Company's reliance upon LTV to meet its substantial future cash needs. However, there can be no assurance that such anticipated improvements will materialize or, if they do, that they will be sufficient to satisfy all of the cash requirements of LTV Steel. Further, while LTV presently intends to continue to maintain advances or, if necessary, to increase advances to LTV Steel, there can be no assurance that in all circumstances LTV funds will be made available to the Company.

PART IV

ITEM 14. EXHIBITS, FINANCIAL STATEMENT SCHEDULES AND REPORTS ON FORM 8-K

(a) (1) and (2) List of Consolidated Financial Statements and Financial Statement Schedules.

Reference is made to the listing preceding the consolidated financial statements and schedules attached hereto on page F-1 for a list of all financial statements and schedules filed as exhibits and a part of this Report.

(a) (3) List of Exhibits.

Reference is made to the listing under (c) below for a list of all other exhibits filed as part of this Report.

(b) Reports on Form 8-K.

A Report on Form 8-K dated December 19, 1984 was filed reporting Item 2. Acquisition or Disposition of Assets. In connection with the merger of Jones & Laughlin Steel Incorporated ("J&L Steel Inc."), with and into Republic Steel Corporation ("Republic"), the following financial statements were filed:

J&L Steel Inc. and Republic Pro Forma Condensed Combined Financial Statements (unaudited):

- Pro Forma Condensed Combined Balance Sheet - September 30, 1984.
- Pro Forma Condensed Combined Statement of Operations - Nine months ended September 30, 1984.
- Pro Forma Condensed Combined Statement of Operations - Year ended December 31, 1983.
- Notes to Pro Forma Condensed Combined Financial Statements.

Audited Financial Statements of Republic:

- Consolidated Balance Sheets - December 31, 1982 and 1983.
- Statements of Consolidated Changes in Financial Position - Years ended December 31, 1981, 1982 and 1983.
- Notes to Consolidated Financial Statements.

Unaudited interim financial statements of Republic:

- Consolidated Balance Sheet - September 30, 1984.
- Statements of Consolidated Operations - Three and nine months ended September 30, 1983 and 1984.
- Notes to Consolidated Financial Statements.

(c) Exhibits

Certain of the exhibits to this Report are hereby incorporated by reference, as specified below, to other documents filed with the Commission by LTV or Republic. Exhibit designations below correspond to the numbers assigned to exhibit classifications in Regulation S-K.

(2)	- Plan of acquisition, reorganization, arrangement, liquidation or succession.
(2)-(1)	- Plan and Agreement of Merger, dated as of December 15, 1984, by and between Republic and J&L Steel Inc., filed as Exhibit E to Report on Form 8-K dated December 19, 1984, incorporated herein by reference.
(3)	- Certificate of Incorporation and By-laws.
(3)-(1)	- Restated Certificate of Republic dated May 31, 1984, filed as part of Exhibit A to LTV's Registration Statement No. 2-90506, incorporated herein by reference.
(3)-(2)	- Certificate of Amendment To The Restated Certificate of Incorporation, dated November 29, 1984, filed as part of Exhibit E to Report on Form 8-K dated December 19, 1984, incorporated herein by reference.
(3)-(3)	- By Laws of Republic as amended December 19, 1984, filed herewith on page E-1.
(4)	- Instruments defining the rights of security holders, including indentures.
(4)-(1)	- Agreement to furnish to the Commission, upon the request of the Commission, a copy of certain instruments related to the Registrant's debt, filed herewith on page E-14.
(10)	- Material Contracts.
(10)(a)-(1)	- Seven Agreements dated June 15, 1982 between Republic and seven corporate officers, filed herewith on page E-15.

(10)(a)-(2) - Consolidated Federal Income Tax Agreement between LTV and Republic Steel, dated as of June 30, 1984, filed herewith on page E-267.

(10)(a)-(3) - Conformed Stipulation and Final Judgment dated March 21, 1984 among the United States of America as plaintiff and The LTV Corporation; Jones & Laughlin Steel Incorporated; J&L Specialty Steel, Inc.; and Republic Steel Corporation filed as exhibit (10)(c)(5) to LTV's Report on Form 10-K for the year ended 12/31/84, incorporated herein by reference.

(d) Financial Statement Schedules.

The response to this portion of Item 11 is submitted as a separate section of this Report.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cleveland, on the 29th day of March, 1985.

LTV STEEL COMPANY, INC.

By /s/ D. H. Hoag
D. H. Hoag
President and
Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this report has been signed by the following persons on behalf of the Registrant and in the capacities indicated and on the date indicated.

Signature	Title	Date
/s/ D. H. Hoag (D. H. Hoag)	President and Chief Executive Officer (Principal Executive Officer)	March 29, 1985
(R. L. Guyett)	Vice President and Controller (Principal Accounting Officer)	
(J. F. Powers)	Vice President and Treasurer (Principal Financial Officer)	
(James J. Paulos)	Director	
(Raymond A. Hay)	Director	

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Dallas, on the 29th day of March, 1985.

LTV STEEL COMPANY, INC.

By______________________________
D. H. Hoag
President and
Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this report has been signed by the following persons on behalf of the Registrant and in the capacities indicated and on the date indicated.

Signature	Title	Date
(D. H. Hoag)	President and Chief Executive Officer (Principal Executive Officer)	March 29, 1985
/s/ R. L. Guyett (R. L. Guyett)	Vice President and Controller (Principal Accounting Officer)	
/s/ J. F. Powers (J. F. Powers)	Vice President and Treasurer (Principal Financial Officer)	
/s/ James J. Paulos (James J. Paulos)	Director	
/s/ Raymond A. Hay (Raymond A. Hay)	Director	

ANNUAL REPORT ON FORM 10-K

ITEM 8, ITEM 14(a)(1) and (2) and ITEM 14(d)

LIST OF CONSOLIDATED FINANCIAL STATEMENTS

FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

AND FINANCIAL STATEMENT SCHEDULES

YEAR ENDED DECEMBER 31, 1984

LTV STEEL COMPANY, INC. AND SUBSIDIARIES

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
A Subsidiary of The LTV Corporation

FORM 10-K - ITEM 14(a)(1) AND (2)
LIST OF CONSOLIDATED FINANCIAL STATEMENTS AND FINANCIAL STATEMENT SCHEDULES

The following consolidated financial statements and schedules of LTV Steel Company, Inc. and subsidiaries and related report of independent accountants are included in Item 8:

Page

Report of independent accountants.......................................F-2
At December 31, 1984 and 1983:
  Consolidated balance sheet...F-4
For the years ended December 31, 1984, 1983 and 1982:
  Consolidated statement of operations.................................F-3
  Consolidated statement of changes in financial position...............F-6
Notes to consolidated financial statements..............................F-7

The following consolidated financial statement schedules of LTV Steel Company, Inc. and subsidiaries are included in Item 14(d):

Schedules for years ended December 31, 1984, 1983 and 1982:
  V - Property, plant and equipment...................................S-1
  VI - Accumulated depreciation, depletion and amortization of property, plant and equipment................................S-4
  VIII - Valuation and qualifying accounts S-6

All other schedules for which provision is made in the applicable regulation of the Securities and Exchange Commission have been omitted as the schedules are not required under the related instructions, are inapplicable, or the information required thereby is set forth in the consolidated financial statements or the notes thereto.

REPORT OF INDEPENDENT ACCOUNTANTS

Shareholder and Board of Directors
LTV Steel Company, Inc.
Dallas, Texas

We have examined the consolidated financial statements and related schedules listed in Item 14(a)(1) and (2) of the annual report on Form 10-K of LTV Steel Company, Inc. (resulting from the combination of Jones & Laughlin Steel Incorporated and, from July 1, 1984, the steel operations of Republic Steel Corporation), a wholly-owned subsidiary of The LTV Corporation, and subsidiaries for the year ended December 31, 1984. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the consolidated financial position of LTV Steel Company, Inc. and subsidiaries at December 31, 1984 and 1983, and the consolidated results of their operations and changes in their financial position for each of the three years in the period ended December 31, 1984, in conformity with generally accepted accounting principles applied on a consistent basis. Further, it is our opinion that the schedules referred to above present fairly the information set forth therein in compliance with the applicable accounting regulation of the Securities and Exchange Commission.

ERNST & WHINNEY

Dallas, Texas
February 13, 1985

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
A Subsidiary of The LTV Corporation

CONSOLIDATED STATEMENT OF OPERATIONS

	Year Ended December 31,		
	1984	1983	1982
	(Dollars in thousands)		
Net sales	$4,010,663	$2,788,510	$3,039,445
Operating costs and expenses:			
Cost of products sold	4,096,475	2,828,767	3,142,654
Depreciation and amortization	162,181	87,765	83,750
Selling, general and administrative expenses	168,502	102,539	136,792
Interest and debt discount expense	161,699	81,055	58,496
Interest and other income	(79,053)	(68,866)	(65,710)
Total	4,509,804	3,031,260	3,355,982
Loss from continuing operations before income taxes	(499,141)	(242,750)	(316,537)
Income tax credit	10,918	5,852	10,215
Loss from continuing operations	(488,223)	(236,898)	(306,322)
Discontinued energy products segment:			
Loss from operations	(4,838)	(57,632)	(8,342)
Gain on sale to LTV	61,561	-	-
Net loss	$ (431,500)	$ (294,530)	$ (314,664)

See notes to consolidated financial statements.

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
A Subsidiary of The LTV Corporation

CONSOLIDATED BALANCE SHEET

ASSETS

	December 31,	
	1984	1983
	(Dollars in thousands)	
CURRENT ASSETS		
Cash and cash equivalents	$ 36,692	$ 26,654
Receivables, less allowance for doubtful accounts of $10,614 in 1984 and $9,940 in 1983	229,085	325,649
Receivables from affiliates	110,424	4,659
	339,509	330,308
Inventories		
Finished and semi-finished products	672,025	500,801
Raw materials and supplies	518,581	296,323
Total	1,190,606	797,124
Less - Amount to reduce inventories to LIFO value	(675,221)	(333,044)
Total Inventories	515,385	464,080
Prepaid expenses and other current assets	25,430	11,415
Total Current Assets	917,016	832,457
INVESTMENTS AND OTHER ASSETS		
Investment in and notes receivable from discontinued energy products subsidiary	-	427,341
Investments in and advances to raw material affiliates	171,250	135,987
Other noncurrent assets	156,394	41,511
Total Investments and Other Assets	327,644	604,839
PROPERTY, PLANT AND EQUIPMENT - at cost		
Land	99,574	67,278
Buildings	407,265	166,952
Steel manufacturing facilities	4,532,978	2,507,833
Mining	149,851	79,372
Transportation	50,882	41,160
Furniture, fixtures and other	28,392	9,004
Construction in progress	80,272	46,632
Total	5,349,214	2,918,231
Less - Allowance for depreciation	(2,097,940)	(1,187,861)
Total Property, Plant and Equipment	3,251,274	1,730,370
	$4,495,934	$3,167,666

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
A Subsidiary of The LTV Corporation

CONSOLIDATED BALANCE SHEET

LIABILITIES AND SHAREHOLDER'S EQUITY

	December 31, 1984	December 31, 1983
	(Dollars in thousands)	
CURRENT LIABILITIES		
Accounts payable	$ 450,659	$ 355,422
Payables to affiliates	107,655	24,493
Accrued employee compensation and benefits	391,288	252,117
Other accruals	170,885	123,392
Current maturities of long-term debt	122,026	40,957
Total Current Liabilities	1,242,513	796,381
LONG-TERM DEBT	1,133,054	722,087
LONG-TERM ADVANCES FROM LTV	6,695	367,708
DEFERRALS AND NONCURRENT LIABILITIES		
Employee compensation and benefits	373,753	278,800
Other	111,013	33,025
Total Deferrals and Noncurrent Liabilities	484,766	311,825
COMMITMENTS AND CONTINGENCIES		
SHAREHOLDER'S EQUITY		
Capital stock:		
Preferred stock; authorized 10,000,000 shares in 1984; none issued		
Common stock - par value $10.00 in 1984 and $1.00 in 1983; authorized 50,000,000 shares in 1984 and 5,000 shares in 1983; issued and outstanding: 100 shares in 1984 and 1,000 shares in 1983	1	1
Additional capital	1,398,271	307,530
Retained earnings	230,634	662,134
Total Shareholder's Equity	1,628,906	969,665
	$4,495,934	$3,167,666

See notes to consolidated financial statements.

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
A Subsidiary of The LTV Corporation

CONSOLIDATED STATEMENT OF CHANGES IN FINANCIAL POSITION

	Year Ended December 31,		
	1984	1983	1982
	(Dollars in thousands)		
Sources of Working Capital:			
From operations -			
Net loss from continuing operations	$(488,223)	$(236,898)	$(306,322)
Depreciation and amortization	162,181	87,765	83,750
Facility consolidations and related costs	122,000	-	24,500
Gains from early extinguishment of debt	(1,557)	(3,855)	(12,541)
Amortization of debt discount and expense	8,351	4,148	3,407
Other	(2,658)	(2,625)	(2,821)
Total from (to) Continuing Operations	(199,906)	(151,465)	(210,027)
Increase in long-term debt	16,742	111,283	182,993
Increase in long-term advances from LTV	-	302,066	65,642
Effects of business combination:			
Equity	1,090,741		
Less - Net noncurrent assets	(984,569)		
Working capital generated by combination	106,172		
Disposition of property and businesses	1,562	28,591	42,947
Decrease (increase) in investment in raw material affiliates	(1,932)	13,587	5,173
Decrease in notes receivable from energy products subsidiary	269,426		
Discontinued energy products subsidiary:			
Investment at beginning of year	157,915		
Loss from operations	(4,838)	(57,632)	(8,342)
Gain on disposition	61,561		
Total proceeds	214,638		
Net assets sold to affiliates	179,152	118,943	
Less - Net current assets sold	(94,768)	(77,988)	
Net noncurrent assets sold	84,384	40,955	
Other - net	15,354	10,890	(3,816)
Total Sources	506,440	298,275	74,570
Uses of Working Capital:			
Property additions	137,706	220,352	237,644
Long-term debt becoming current or retired	195,482	60,674	55,820
Gains from early extinguishment of debt	(1,557)	(3,855)	(12,541)
Reduction in long-term advances from LTV	491,933	-	-
Decrease in noncurrent employee benefits	44,449	20,635	22,676
Cash dividends	-	-	15,000
Total Uses	868,013	297,806	318,599
Increase (decrease) in Working Capital	$(361,573)	$ 469	$(244,029)
Changes in Components of Working Capital:			
Increase (decrease) in current assets:			
Cash and cash equivalents	$ 10,038	$ (4,561)	$ 10,650
Receivables	9,201	75,093	(205,738)
Inventories	51,305	8,541	(210,857)
Other	14,015	1,878	(5,333)
Decrease (increase) in current liabilities:			
Accounts payable and accruals	(142,730)	(104,521)	95,424
Payables to affiliates	(83,162)	(14,861)	38,539
Accrued employee compensation and benefits	(139,171)	60,706	42,121
Current maturities of long-term debt	(81,069)	(21,806)	(8,835)
Increase (decrease) in Working Capital	$(361,573)	$ 469	$(244,029)

See notes to consolidated financial statements.

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
A Subsidiary of The LTV Corporation

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 1984

SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

LTV Steel Company, Inc. (LTV Steel) is a wholly-owned subsidiary of The LTV Corporation (LTV). On June 29, 1984, LTV acquired (in a "purchase" transaction) Republic Steel Corporation (Republic) through an exchange of capital stock, whereby Republic became a wholly-owned subsidiary of LTV. On December 19, 1984, LTV Steel was formed by combining the operations of Jones & Laughlin Steel Incorporated (J&L Steel) with the steel operations of Republic. J&L Steel and Republic were wholly-owned subsidiaries of LTV, therefore, the combination of the two affiliated companies was accomplished by combining the balance sheet accounts of the respective companies as of July 1, 1984. The consolidated results of the Company presented herein include the combined operations of J&L Steel and, since July 1, 1984 (the effective date of the transaction for accounting purposes), the ongoing steel operations of Republic.

The consolidated financial statements include LTV Steel and its majority-owned subsidiaries (the Company). Investments in raw materials affiliates and companies owned 20% to 50% are accounted for by the equity method. Equity in the operating results of unconsolidated raw materials affiliates reduces "cost of products sold". All significant intercompany balances and transactions have been eliminated.

Inventories and Related Cost of Products Sold

Inventories are valued at cost determined for the most part by the "last-in, first-out" (LIFO) method (computed using multiple pools, employing the specific goods method) which is lower than market value. Such inventories are stated at current cost prior to reduction to LIFO value. Cost of products sold is computed as though Republic's steel inventories were acquired in 1984 at current cost.

Property Costs and Depreciation and Amortization

Plant and equipment are depreciated principally by the straight-line method on a composite basis over their estimated useful lives, a portion of which are reviewed in depth each year. However, in order to reflect the higher or lower than normal activity levels (based on shipping capacity), the straight-line basis is modified to the extent that depreciation is decreased (but in no event to less than 50% in any one year and, beginning in 1984, not less than a 75% average for the previous four year period, plus the current year) at lower and increased at higher operating levels, thereby providing for depreciation within a range of 50% to 150% of the straight-line amount based on their composite economic useful lives. If the activity rate is above 62.5%, each increase in a percentage point of activity increases the depreciation rate by 1.67%. Under this method, the normal activity rate is considered to be 85% and results in depreciation expense equal to 100% of the total annual straight-line charge. The noncash charge for depreciation was reduced from the computed straight-line amounts in 1984, 1983 and 1982 by $44,000,000, $43,400,000 and $46,500,000, respectively, to recognize the lower than normal operating levels.

In connection with the combination, the Company determined the remaining estimated economic useful lives of certain steelmaking assets had been shortened, and therefore depreciation expense was increased by $17,800,000 in 1984.

When properties are retired or sold, their costs and the related allowance for depreciation are eliminated from the property and allowance for depreciation accounts. Generally for normal retirements, gains or losses are credited or charged against the allowance for depreciation; for abnormal retirements, gains or losses are included in income in the year of disposal.

Debt Discount and Expense

Unamortized debt discount and expense are amortized in a manner which results in a constant rate of interest over the life of the related debt.

Retirement Plans

The Company has various retirement plans covering substantially all of its employees. Pension costs are accrued including amortization (primarily over 40 years) of prior service costs. Contributions are made to Company sponsored pension plans in accordance with the minimum funding requirements of the Employee Retirement Income Security Act of 1974 (ERISA). The Company also provides health care and life insurance benefits for substantially all retired employees, the costs of which are expensed when paid.

Federal Income Taxes

The Company is a member of the LTV consolidated group for Federal income tax purposes and is a party to an agreement with LTV which provides that the Company will pay LTV a charge in lieu of Federal income taxes only in those years in which the Company has taxable income and the consolidated LTV group incurs a Federal income tax liability. In such a case, the Company's charge will equal the payment to be made to LTV and will be the proportionate share of the consolidated tax liability that the Company's taxable income is to the total taxable income of the companies in the group having taxable income. The agreement does not provide for the application of either the carryback or the carryforward of any net operating losses or investment tax credits.

FORMATION OF LTV STEEL COMPANY, INC.

J&L Steel and Republic, wholly-owned steel subsidiaries of LTV, were combined on December 19, 1984 (effective July 1, 1984) to form LTV Steel. Accordingly, the consolidated financial statements of LTV Steel include the historical accounts and operations of J&L Steel and, since July 1, 1984, the accounts and operations of Republic's steel operations.

As of June 29, 1984, the nonsteel assets of Republic were sold to LTV, or an LTV subsidiary and, accordingly, only the operating results of the ongoing steel businesses are reflected in the Company's consolidated financial statements.

Republic's assets and liabilities at July 1, 1984, which were combined with J&L Steel, were as follows (in thousands):

Current Assets	$ 908,506
Current Liabilities	(802,334)
Working Capital	106,172
Property, Plant and Equipment	1,768,106
Other Noncurrent Assets	135,282
Long-Term Debt	(753,674)
Other Noncurrent Liabilities	(165,145)
Total	$ 1,090,741

Republic's previously reported results of operations prior to July 1, 1984 were as follows (in thousands):

	Six Months ended June 30, 1984 (Unaudited)	Year ended December 31, 1983	Year ended December 31, 1982
Net sales	$1,715,595	$2,701,107	$2,738,160
Loss before income taxes, extraordinary item and cumulative effect of accounting changes	$ (70,015)	$ (587,647)	$ (467,851)
Income tax credit	$ 3,909	$ 224,100	$ 224,000
Net loss	$ (77,685)	$ (326,494)	$ (239,219)

Notes: The net loss for the six months ended June 30, 1984 included a net charge of $17,590,000 for unusual items. The 1983 net loss included a charge of $168,284,000 for estimated shutdown expense applicable to previously idled facilities.

The nonsteel assets of Republic, which were sold to LTV or an LTV subsidiary as of June 29, 1984, accounted for approximately 25% of net sales and approximately 15% of the net loss for the period.

The table below summarizes on an unaudited pro forma basis the combined results of operations of J&L Steel and Republic's steel operations and their respective consolidated subsidiaries for the years ended December 31, 1984 and 1983 as if the combination of J&L Steel and Republic had occurred on January 1, 1983. The pro forma amounts primarily reflect adjustments for the exclusion of plant closing costs associated with Republic's closed facilities, LIFO inventory profits realized by Republic in 1984 and 1983, the Federal income tax benefit generated by Republic in 1984 and 1983 and other non-recurring items. All significant intercompany transactions and accounts of the companies with each other have been eliminated.

Accounting methods and practices (including changes in inventory costing, depreciable lives and pension plan assumptions) have been conformed to those of LTV Steel. These pro forma results are not necessarily indicative of future results of operations or of what results would have been for the combined operations.

	1984	1983
	(In millions)	
Net sales	$ 5,202	$ 4,792
Loss from continuing operations	(563)	(536)
Net loss	(482)	(658)

SALE OF ENERGY PRODUCTS SEGMENT

On April 23, 1984, the Company finalized the sale of its 91% interest in LTV Energy Products Company (LTV Energy) to LTV. The sale of the energy products business segment was effective as of March 30, 1984. The $214,638,000 proceeds from the sale were equal to the Company's investment increased by 91% of the excess of the gross value over the LIFO carrying value of the inventory which resulted in a gain of $61,561,000. The proceeds reduced LTV's long-term advances to the Company. The Company's notes receivable beginning March 30, 1984 from LTV Energy provided for interest at the prime rate. Interest income in 1984 from the receivable (paid in 1984) was $22,679,000.

Operating results of the discontinued energy products business segment for the first three months in 1984 and the years ended December 31, 1983 and 1982 were as follows (in thousands):

	1984	1983	1982
Net sales	$ *	$476,692	$1,202,584
Operating income (loss)	*	(60,154)	35,037
Net loss	(4,838)	(57,632)	(8,342)

* Results reported as discontinued operations.

The consolidated financial statements have been reclassified for the discontinued energy products segment for the years prior to 1984.

DISPOSITION OF ASSETS

On November 30, 1984, the Company sold certain net assets of its tubular products finishing plants to LTV Tubular Products Company, an LTV subsidiary. The proceeds of $109,272,000 from the sale resulted in a gain of $32,500,000 (included in "Other Income"), representing the excess of the gross value of the inventory over the LIFO carrying value thereof. Sales by the tubular products finishing operations were $266,000,000 in the eleven months of 1984, $96,000,000 in 1983 and $607,000,000 in 1982.

Additionally, in late 1984, the Company sold to LTV its interest in certain ocean vessels and a mining partnership for $69,880,000. No gain or loss was realized on these dispositions.

On July 31, 1983, the Company sold all of its stainless steel finishing operations, including related assets and liabilities, to LTV Specialty Steels, Inc., an LTV subsidiary. The sales price of $118,943,000 resulted in a gain of $22,020,000 (included in "Other Income"), representing the excess of the gross value of the inventory over the LIFO carrying value thereof. Sales by the stainless steel finishing operations were $131,000,000 in the first seven months of 1983 and $202,000,000 in 1982.

INVENTORIES

The liquidation of LIFO inventory quantities carried as though acquired at lower costs which prevailed in earlier years reduced cost of products sold by approximately $8,000,000 in 1983 and $42,000,000 in 1982. There were no LIFO benefits recognized in 1984.

PREPAID EXPENSES AND OTHER CURRENT ASSETS

In accordance with the terms of the Ohio Series L bond indenture agreement, the Company deposited $17,444,000 at December 31, 1984 with an escrow agent. In early 1985, the bondholders will elect to either have the Company repurchase or refinance such bonds. The Company may resell those bonds which it repurchases.

INVESTMENTS IN AND ADVANCES TO RAW MATERIAL AFFILIATES

Summarized financial information for raw material operations owned jointly with others and accounted for on an equity basis was as follows (in thousands):

	December 31,	
	1984	1983
Current assets	$ 399,617	$ 335,649
Current liabilities	319,323	252,757
Total assets	1,862,807	1,701,739
Long-term debt	672,428	564,752
Shareholders' and partners' equity	760,212	780,751
The Company's equity in net assets, excluding intercompany balances	188,175	171,950

	Year ended December 31,		
	1984	1983	1982
Total sales and revenues	$1,188,359	$1,077,690	$ 837,737
Net income (loss)	223,677	75,633	(73,781)
The Company's equity in operating results	68,755	58,502	(9,079)

In addition, changes in quantities of inventory resulted in elimination of $5,551,000 and $6,622,000 of intercompany raw material profit in 1984 and 1983, respectively, and in recognition of $19,757,000 of additional intercompany profit in 1982 which had been deferred in prior years. As a result, consolidated cost of goods sold was decreased by $63,204,000 in 1984, $51,880,000 in 1983 and $10,768,000 in 1982 for the net effect of the Company's equity in operating results of raw material affiliates and related intercompany profit.

The Company's equity in the cumulative undistributed earnings of its unconsolidated raw material affiliates was $35,485,000 at December 31, 1984. Due to limitations contained in various loan agreements of the affiliates, only $26,298,000 of the cumulative undistributed earnings was available for dividend or distribution to the Company at December 31, 1984.

DEBT, AND ADVANCES FROM LTV

During the first quarter of 1984, the Company terminated its separate bank credit agreement. The Company and certain other LTV subsidiaries have an agreement with LTV Sales Finance Company (Finance), a wholly-owned subsidiary of LTV, under which the Company and the other LTV subsidiaries can sell certain trade accounts receivable, with recourse, to Finance. Effective June 29, 1984, the amount of bank credit funds available from the sale of such receivables was increased to $300,000,000. Finance, in turn, can borrow through June 30, 1992 up to 80% of the book value of these eligible trade receivables. Effective December 13, 1984, Finance increased its maximum borrowing capacity to $350,000,000. A fee is payable to Finance by the Company which will provide Finance with income, before interest costs and income taxes, of 1 1/2 times Finance's interest costs. At December 31, 1984, receivables of the Company totaling $242,783,000 had been sold to Finance and there were borrowings of $171,000,000 under its bank credit agreement. Under the Finance agreement, interest is generally payable at the lender's prime commercial rate or, at the Company's option, at rates based on certificate of deposit rates or the London interbank offered rate on Eurodollar borrowings. The credit line matures in 1992; however, beginning on September 30, 1988, the commitment under the credit line will be reduced by approximately $22,000,000 per quarter and, effective July 1, 1988, the interest rates will increase by 1/4 of one percent. Commitment fees of 1/2 of one percent per annum are generally payable based on the unused line. The banking arrangement calls for either the maintenance of average compensating balances approximating 5 percent of the credit line or the payment of a fee for balance deficiencies. The funds on deposit under this arrangement are not subject to withdrawal restrictions.

The following is a summary of bank borrowings under the Company's bank credit agreement which was terminated during the first quarter of 1984 (in thousands):

	1984	1983	1982
Borrowings during the year:			
Year-end balance	$ -	$100,000	$100,000
Month-end average	$ 25,000	$100,000	$ 15,400
Maximum at any month end	$100,000	$100,000	$100,000
Interest rates:			
Year end	- %	10.9%	10.1%
Average during the year	11.3%	10.6%	12.9%

Interest on LTV advances to the Company was payable at the prime rate at the beginning of each quarter. Daily advances during 1984 ranged from a low of $6,695,000 to a high of $584,960,000, with a maximum outstanding at any month end of $537,483,000. Interest expense paid to LTV and its affiliated companies was $58,726,000 in 1984, $21,372,000 in 1983 and $20,000,000 in 1982.

DEBT, AND ADVANCES FROM LTV (continued)

Long-term debt was comprised of the following at each year end (in thousands):

	1984	1983
Notes Payable to Banks	$ -	$100,000
6 3/4% Subordinated Debentures, due through April 1, 1994	10,295	10,995
12 1/8% Subordinated Debentures, due through June 1, 2003	192,500	-
4 3/8% Sinking Fund Debentures, due through September 1, 1985	8,000	-
8.90% Sinking Fund Debentures, due through November 15, 1995	54,444	-
First Mortgage Bonds:		
Series D, 4 3/4%, due through April 1, 1987	9,000	9,000
Series E, 5%, due through February 1, 1991	18,753	18,753
Series F, 9 7/8%, due through April 1, 1995	22,200	22,775
Series G, 8%, due through May 1, 1998	20,900	20,900
Series H, 7 1/2%, due April 1, 1986	12,000	12,000
Series I, 8 3/4%, due April 1, 1995 through April 1, 2005	18,000	18,000
Series J, 7 7/8%, due July 15, 1985	4,000	4,000
Series K, 8 7/8%, due July 15, 1990 through July 15, 2005	7,500	7,500
Series L, 7 7/8%, due July 15, 1985	3,500	3,500
Series M, 8 7/8%, due July 15, 1990 through July 15, 2005	10,000	10,000
Series N, 9 3/4%, due through August 1, 1996	42,300	42,300
Series O, 10 1/2%, due through December 15, 2001 (90% Guaranteed by the Department of Commerce's Economic Development Administration)	104,990	111,100
Series P, 11%, due August 1, 1990	6,000	6,000
Series Q, 12%, due August 1, 2001 through August 1, 2010	27,500	27,500
Series R, 11 3/4%, due August 1, 1991 through August 1, 2000	10,000	10,000
Series S, 12%, due December 1, 1990	7,250	7,250
Series T, 14%, due December 1, 2010	8,000	8,000
Series U, 12 3/4%, due December 1, 2001 through December 1, 2011	6,750	6,750
First Mortgage Sinking Fund Bonds:		
Series H, 4 1/2%, due through October 1,1990	15,708	19,273
Series I, 4.6%, due through July 1, 1995	38,000	41,000
Series J, 10 1/2%, due through August 1, 2000	20,900	21,650
Series K, 9 7/8%, due through May 15, 1991	34,473	38,523
Balance carried forward	$712,963	$576,769

	1984	1983
Balance brought forward	$712,963	$576,769
Pollution Control:		
Series A, B and C, 6 1/2%, due through October 1, 1998	24,225	24,650
Series D, 8.45% to 9%, due through June 15, 2005	18,190	18,190
Series E, 8.2% to 8.5%, due June 1, 1986 through June 1, 2006	22,000	22,000
Pollution Control Revenue Bonds:		
Illinois Series A, 5.35%, due through January 1, 1986	1,039	-
Illinois Series C, 6.75% to 8.25%, due through August 1, 2000	45,000	-
Illinois Series F, 7 1/8% to 7.4%, due October 1, 1995 through October 1, 2009	14,000	-
Ohio Series E, 7 1/8% to 7.4%, due October 1, 1995 through October 1, 2009	41,000	-
Ohio Series G, 8 3/8%, due January 1, 2005	25,000	-
Ohio Series H, 5.1%, due February 1, 1990 through February 1, 1995	25,000	-
Ohio Series K, 9 1/4%, due through October 15, 2000	11,560	-
Ohio Series L, 9 3/4%, due April 1, 1985 and 2012	25,000	-
Ohio Series M, 12 1/4%, due April 1, 1992	40,000	-
Erie County Series O, 10%, due September 1, 2012	10,000	-
Other Pollution Control obligations	16,460	12,255
4.65% Notes, due through May 1, 1989	31,250	-
12% Note, due through August 1, 1989	15,800	15,800
8.45% Notes, due May 15, 1988 through May 15, 2002	50,000	-
9.44% deferred equipment purchase contract, due through October 16, 1988	27,552	34,440
Notes payable, due September 30, 1985	27,315	50,000
Other	7,581	1,785
Capitalized lease obligations	118,598	51,664
	1,309,533	807,553
Less: Unexpended pollution control funds	(11,021)	(20,552)
Unamortized discount	(43,432)	(23,957)
Current maturities	(122,026)	(40,957)
	$1,133,054	$722,087

Annual maturities through 1989 of long-term indebtedness (excluding capital leases) in excess of reacquired bonds available for sinking fund requirements were as follows at December 31, 1984 (in thousands):

Year	Amount
1985	$108,113
1986	61,807
1987	53,413
1988	58,532
1989	53,845

Future minimum lease payments for capital leases and noncancellable operating leases at December 31, 1984 were (in thousands):

	Capital Leases	Operating Leases
1985	$ 23,534	$ 14,624
1986	14,363	12,007
1987	23,035	8,347
1988	13,662	5,991
1989	12,103	4,599
Later years	119,495	23,100
Total minimum lease payments	206,192	$ 68,668
Less amount representing interest	(87,594)	
Present value of net minimum lease payments	$118,598	
Minimum future sublease rentals to be received	$ 7,230	$ 3,069

The charges to operations for rental expense of all operating leases were $44,027,000 in 1984, $28,627,000 in 1983 and $27,785,000 in 1982.

Interest costs capitalized as part of the acquisition cost of certain construction projects were $2,761,000 in 1984, $14,612,000 in 1983 and $13,892,000 in 1982.

Land, buildings and equipment with a net book value of approximately $1,700,000,000 are pledged as collateral for mortgage bonds of the former J&L Steel.

The unexpended pollution control bond funds are classified as reductions to long-term debt since these are funds from pollution control bond issues which are held by a trustee until utilized either for the construction and installation of specified pollution control facilities or for the repayment of principal and interest on bonds when due.

The Company's debt instruments contain provisions which require, among other things, maintenance of a minimum level of net worth ($1,450,000,000 at December 31, 1984 through December 31, 1985, decreasing to $1,300,000,000 through December 31, 1986 and to $1,250,000,000 thereafter) and financial ratios. At December 31, 1984, certain of these provisions restricted the Company from increasing its long-term debt until certain financial condition ratios are met, and required approximately $635,000,000 of subsequent cumulative net income before the Company could declare a dividend on its common stock.

RETIREMENT PLANS

Provisions for retirement plan costs were $141,635,000 in 1984, $126,733,000 in 1983 and $138,103,000 in 1982. Pension costs from 1983 to 1984 increased primarily because of the inclusion of Republic's steel operations effective July 1, 1984 and were offset in part by the net effect of increases in actuarial assumptions for the projected interest rate and salary scale. The decrease in costs from 1982 to 1983 was primarily due to changes in actuarial assumptions to reflect estimated reductions in future participation of employees currently on layoff.

The accumulated plan benefits and plan net assets for the Company's defined benefit plans as of the most recent valuation dates (January 1, 1984 and 1983, respectively, except for Republic as to which the date was July 1, 1984) were as follows (in thousands):

	1984	1983
Actuarial present value of vested accumulated plan benefits	$2,625,391	$1,542,557
Net assets available for plan benefits	2,005,318	1,162,731
Excess	$ 620,073	$ 379,826
Actuarial present value of nonvested accumulated plan benefits	$ 173,993	$ 161,077

The weighted average assumed rate of return used in determining the actuarial present value of accumulated plan benefits was 10 percent.

The expense for health care and life insurance benefits provided to retired employees was $55,600,000 in 1984.

SHAREHOLDER'S EQUITY

Shareholder's equity changes during the three years in the period ended December 31, 1984 were as follows (in thousands):

	Common Stock	Additional Capital	Retained Earnings
Balance at January 1, 1982	$ 1	$ 307,568	$1,286,328
Net loss	-	-	(314,664)
Dividends declared on common stock	-	-	(15,000)
Other	-	(38)	-
Balance at December 31, 1982	1	307,530	956,664
Net loss	-	-	(294,530)
Balance at December 31, 1983	1	307,530	662,134
Addition of equity of Republic (see "Formation of LTV Steel Company, Inc." note)	-	1,090,741	-
Net loss	-	-	(431,500)
Balance at December 31, 1984	$ 1	$1,398,271	$ 230,634

MAINTENANCE AND REPAIRS

Costs for maintenance and repairs were $588,122,000 in 1984, $394,343,000 in 1983 and $507,959,000 in 1982.

TAXES

The credit for taxes on the loss and credit in lieu of Federal income taxes were as follows for each of the three years in the period ended December 31, 1984 (in thousands):

	1984	1983	1982
Current:			
Credit in lieu of Federal income taxes	$ -	$ -	$ 8,543
Federal	7,533	(701)	1,819
State	4,003	6,302	(147)
Foreign	(618)	-	-
Total current	10,918	5,601	10,215
Deferred	-	251	-
Total credit	$ 10,918	$ 5,852	$ 10,215

In accordance with the tax agreement with LTV (see SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES), a charge in lieu of Federal income taxes is provided when the Company has taxable income and the consolidated LTV group incurs a Federal income tax liability. There was no charge in lieu of Federal income taxes in any of the three years ended December 31, 1984 since the consolidated LTV group did not incur a Federal income tax liability. The 1982 credit in lieu of Federal income taxes was due to a reduction in the consolidated LTV group's 1981 Federal income tax liability based on LTV's 1981 consolidated Federal income tax return which was filed in September 1982.

The 1984 current Federal income tax credit of $7,533,000 resulted principally from the settlement of prior years Federal taxes and the resulting reversal of income tax accruals which were no longer required. The 1983 deferred and the 1983 and 1982 current Federal amounts related to a 53 percent owned corporation which cannot, under applicable Treasury regulations, be included in the LTV consolidated tax return. The state income tax credit in 1984 and 1983 resulted primarily from the reversal of certain income tax accruals which were no longer required.

TRANSACTIONS WITH LTV AND AFFILIATES

The Company's allocated portion of LTV's general and administrative expenses was $24,395,000 in 1984, $17,555,000 in 1983 and $23,435,000 in 1982.

The Company charged to affiliates management fees and allocated general and administrative expenses of $23,120,000 in 1984 and $7,202,000 in 1983.

During 1983 and 1982, the Company received $32,811,000 and $36,203,000, respectively, reported as "Other Income", from LTV's sale of tax benefits through "safe harbor tax leases" of property owned by the Company.

The Company during 1984 and 1983 sold the net assets of various businesses to LTV or its subsidiaries as described in other notes to the consolidated financial statements. See the "Debt, and Advances from LTV" note regarding the sale of accounts receivable to Finance.

COMMITMENTS AND CONTINGENCIES

The Company's steelmaking operation is subject to a number of environmental laws and regulations. The application of these laws and regulations create uncertainties as to their precise financial impact on the Company, with respect to operating costs and capital expenditures as well as the timing of such expenditures.

In January 1983, the U.S. Department of Justice filed motions with U.S. District Courts in Indiana, Ohio and Pennsylvania seeking contempt orders and aggregate fines of over $108,000,000 for alleged violations of consent decrees which had been entered into by the Company (the former J&L Steel) during 1981 for the purposes of enforcement of federal environmental laws and regulations at its steelmaking facilities. In the first quarter of 1984, an agreement was reached among the Company (the former J&L Steel), LTV, the U.S. Environmental Protection Agency and the U.S. Department of Justice which would settle substantially all pending litigation with the federal government with respect to environmental matters involving the Company's steelmaking operation. The agreement was approved by the U.S. District Courts in Indiana and Pennsylvania, which exercised jurisdiction over the proceedings. The agreement is still subject to approval by the U.S. District Court in Cleveland, Ohio. The settlement required a payment by the Company of approximately $4,000,000 in cash penalties (accrued as of December 31, 1983) and further required the Company to undertake certain environmental control capital projects. The additional capital expenditure requirements associated with such projects at its major steel plants are not expected to be material.

The Company (the former Republic) is also currently defending against environmental actions filed in Illinois, New York and Ohio by the U.S. Environmental Protection Agency and other state and local environmental authorities. While it is not possible to predict with certainty the outcome of these actions, management believes that the total cost of fines, penalties or capital expenditures for environmental projects which may result from such actions will not materially affect the consolidated financial position of the Company.

The Company currently estimates that the total capital cost of complying with all environmental requirements will be approximately $25,000,000 in 1985, and average approximately $17,000,000 per year (in future dollars to be paid) for the period 1986-1988.

The Company, in the ordinary course of business, is the subject of or party to various other pending or threatened litigation. While it is not possible to predict with certainty the outcome of these matters, management of the Company does not believe that they will materially affect the consolidated financial position of the Company.

During 1983, 1982 and 1981, the Company received income from LTV's sale of tax benefits through safe harbor tax leases. Under certain circumstances and events, the Company may be required to repay part or all of the proceeds from these sales and similar sales by the former Republic prior to its merger with LTV.

The Company has long-term raw material supply contracts with its joint ventures and with outside suppliers that commit it to annual future purchases of iron ore and coal at volumes which are less than its anticipated annual requirements. Such purchases during 1984, 1983 and 1982 approximated $651,000,000, $460,000,000 and $315,000,000, respectively. The Company is also committed to share in the costs to be incurred by its raw material joint ventures, to the extent funds so required are not generated by their operations. It is anticipated that the Company will not be required to purchase or pay for raw materials which exceed its requirements.

In the event certain of the affiliates supplying raw materials to the Company are unable to make payments on their indebtedness (principally related to construction of facilities), the Company has agreed to pay specified amounts thereof aggregating $207,891,000 at December 31, 1984, of which $192,595,000 relates to the Company's 50% interest in Reserve Mining Company. In addition, the Company is guarantor of payment of indebtedness totaling $98,000,000 of a former subsidiary, the stock of which was sold to the Company's parent, LTV, as of the date of the acquisition of Republic by LTV.

SEGMENT REPORTING

Steel products constitute the Company's business and account for substantially all of the Company's sales, operating results and identifiable assets. In prior years, the Company had two segments - steel and energy products. Effective March 30, 1984, the Company sold its 91% interest in its energy products subsidiary, LTV Energy Products Company, to LTV. Sales during the years 1984, 1983 and 1982 to the Company's largest unaffiliated customer, General Motors Corporation, represented approximately 12%, 11% and 6%, respectively, of consolidated net sales. Sales to Federal, state and local government agencies or to customers outside the United States were less than 10% of consolidated sales.

QUARTERLY FINANCIAL INFORMATION (Unaudited)

The following table presents unaudited sales and operating results by quarter for the years 1984 and 1983 (in thousands):

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter (2)	Total
1984 (1)					
Net sales	$ 770,284	$ 905,105	$1,252,230	$1,083,044	$4,010,663
Operating loss (3)	$ (39,879)	$ (10,940)	$ (96,582)	$ (251,350)	$ (398,751)
Loss from continuing operations	$ (63,892)	$ (33,036)	$ (133,483)	$ (257,812)	$ (488,223)
Net loss	$ (7,169)	$ (33,036)	$ (133,483)	$ (257,812)	$ (431,500)
1983					
Net sales	$ 627,026	$ 719,544	$ 687,084	$ 754,856	$2,788,510
Operating loss (3)	$ (86,711)	$ (50,797)	$ (27,065)	$ (51,267)	$ (215,840)
Loss from continuing operations	$ (103,346)	$ (68,636)	$ (31,936)	$ (32,980)	$ (236,898)
Net loss	$ (116,696)	$ (85,715)	$ (45,722)	$ (46,397)	$ (294,530)

(1) Results of Republic are included from July 1, 1984. See "Formation of LTV Steel Company, Inc." note to consolidated financial statements.

(2) Results for the third and fourth quarters of 1984 included special charges of $20,000,000 and $142,000,000, respectively, for facility rationalization and staff reductions. Results for the fourth quarter of 1983 included a special charge of $4,000,000 for settlement of environmental matters and a credit of $27,000,000 from the sales of tax benefits through safe harbor tax leases.

(3) Operating loss represents total sales less cost of products sold and operating expenses. In computing operating loss, none of the following items have been added or deducted: general corporate expenses, interest expense, income taxes, credits from gains from early extinguishment of debt, non-operating interest and other income or discontinued operations.

SUMMARY INFORMATION ON CHANGING PRICES (Unaudited)

The high level of inflation experienced in the United States and abroad since 1970 distorts the comparability between companies and between years of reported historical-cost based results of operations and financial positions. As a result, generally accepted accounting principles in the United States require that major companies present supplemental information that attempts to measure the impact of inflation.

The "current cost" method recognizes that not all assets change in prices at the same rate of inflation and attempts to revalue a company's existing assets to their current in-place reconstructed cost. This method of inflation-related accounting unrealistically attempts to reflect today's cost of replacement of existing productive facilities. In practice, businesses do not merely replace their existing facilities. Replacement may be made with other facilities having a different cost or having a greater production capacity. There are factors other than depreciation that also have to be considered in determining inflation adjusted cost of products sold. Labor, material and overhead costs can increase or decrease on a per unit basis when future technology or capital expenditure requirements are considered.

Subjective judgment and numerous assumptions are involved in developing the required disclosures; therefore, the following results, amounts and discussions should not be considered precise indicators of either the effects of inflation or the value of the assets of the Company.

Financial Data Adjusted for Effects of Changing Prices

The statement of consolidated income from continuing operations for the year ended December 31, 1984 adjusted for changing prices is as follows (in millions):

	Historical Cost	Current Cost (Average 1984 Dollars)
Net sales	$4,010.7	$4,010.7
Cost of products sold	4,096.5	4,096.5
Depreciation and amortization	162.2	442.6
Other costs and expenses	330.1	330.1
Interest and other income	(79.0)	(78.7)
Income tax credit	(10.9)	(10.9)
	4,498.9	4,779.6
Loss from continuing operations	$ (488.2)	$ (768.9)

SUMMARY INFORMATION ON CHANGING PRICES (Unaudited)(continued)

Management's Assessment of the Impact of Inflation on the Company

As outlined below under "Explanation of Methods and Adjustments", significant impacts on the Company's inflation-adjusted results of operations include an increase in depreciation expense and a reduction in gains on disposal of assets to reflect the relatively higher cost of new assets compared with the original cost of assets actually being used or sold. These reductions assume that facilities must be replaced. However, many of the Company's recent asset disposal decisions were made in accordance with management strategy to generate cash from less productive assets which can then be redeployed into products having more favorable long-term prospects. Also, the Company has recently been able to make significant productivity improvements in key areas with relatively low investment in fixed assets.

Since most of the Company's inventories are valued using the LIFO method, inventory holding gains are already excluded from historical cost-based-results of operations.

The decrease in general inflation over the increase in current costs of inventory and fixed assets indicates that specific prices in 1984 increased at a faster rate than the general inflation rate. This is a reversal of the trend that existed prior to 1984 when the rate of general inflation traditionally exceeded specific price increases.

The Company gains from inflation as a result of net amounts owed, as do most companies with significant fixed assets and long-term debt. In 1980, the purchasing power gain largely offsets the reduction outlined above in inflation-adjusted operating results while, in 1981 through 1984, such purchasing power gains were lower, although still substantial.

Explanation of Methods and Adjustments

Inventories - Prior to the reduction to LIFO value, the majority of the Company's detail inventory records are maintained on a current value basis which was used to estimate current cost.

Property, Plant and Equipment - Current cost amounts for property, plant and equipment were determined primarily by applying appropriate industrial construction indices to historical costs. To determine the current cost of property of acquired businesses, the indices were applied to the original cost of the property at the date originally purchased by the acquired company.

Depreciation - The same depreciation methods and useful lives used in computing depreciation expense included in the primary financial statements were also used for the current cost disclosures.

SUMMARY INFORMATION ON CHANGING PRICES (Unaudited)(continued)

Cost of Products Sold - Cost of products sold was estimated using historical LIFO based cost which approximates current cost, adjusted primarily for reinstatement of the value of the liquidation of those LIFO quantities carried at lower costs.

Other Income - Under the current cost method, historical cost gains or losses were excluded from other income and were included in the calculation of holding gains.

Income Taxes - Income taxes are stated at historical cost for the current cost disclosure as required by the FASB.

Mining Reserves

The Company owns and has equity in various ventures which own and operate iron ore, coal and limestone properties. The Company's share of proven reserves and production (in millions of tons) and market prices (per ton) for the five years 1980 through 1984 are summarized as follows:

	Proven Reserves					Minerals Produced				
	1984	1983	1982	1981	1980	1984	1983	1982	1981	1980
IRON ORE (Gross Tons)*										
Consolidated properties	9.3	10.2	12.0	3.5	3.5	0.7	0.9	0.6	0.5	0.7
Equity interest properties	783.0	614.5	572.3	587.5	605.8	7.1	5.7	3.9	8.9	7.6
METALLURGICAL COAL (Net Tons)										
Consolidated properties	25.0	3.8	4.2	90.9	89.1	0.7	0.5	0.5	2.1	2.8
Equity interest properties	159.7	33.1	38.6	39.3	39.0	1.6	0.9	0.7	1.0	1.8
LIMESTONE (Gross Tons)										
Equity interest properties	259.0	133.0	134.2	134.8	135.9	2.4	1.0	0.8	1.2	1.2

* Iron content equals approximately 64%.

	Average Market Price				
	1984	1983	1982	1981	1980
IRON ORE	$42.87	$41.52	$42.24	$41.84	$37.08
METALLURGICAL COAL	41.15	46.04	51.41	50.35	47.70
LIMESTONE	3.39	3.50	3.38	3.13	2.90

Proven coal reserves sold in place amounted to approximately 86 million gross tons in 1982 and 274 million gross tons in 1980. The average market prices are not indicative of the value of the above reserves since significant costs will be incurred in extracting such reserves. Therefore, an aggregate value for the above reserves cannot be determined by multiplying the market price by the tons of mineral reserves.

SUMMARY INFORMATION ON CHANGING PRICES (Unaudited)(continued)

The following is a five-year comparison of selected financial information adjusted for the effects of changing prices (all amounts, except historical amounts, are stated in millions at 1984 average-of-year dollars).

	1984	1983	1982	1981	1980
Net sales:					
In historical dollars	$4,010.7	$2,788.5	$3,039.4	$4,785.4	$3,800.2
Adjusted for effects of general inflation	4,010.7	2,907.2	3,270.7	5,465.3	4,790.3
Income (loss) from continuing operations:					
In historical dollars	(488.2)	(236.9)	(306.3)	274.5	33.8
Adjusted for specific price changes	(768.9)	(399.2)	(516.9)	102.5	(31.5)
Gain from change in purchasing power of net amounts owed	64.1	45.9	40.3	101.1	168.8
Net assets at year end:					
In historical dollars	1,628.9	969.7	1,264.2	1,593.9	1,261.2
Adjusted for specific price changes	4,554.1	2,874.2	3,448.7	3,971.7	3,996.1
Holding gains on inventories and property, plant and equipment:					
Increase in general inflation	187.0	165.7	249.0	429.0	569.8
Increase in specific prices	227.4	98.5	238.8	364.6	322.6
Increase (decrease) in general inflation over increase in specific prices	(40.4)	67.2	10.2	64.4	247.2
Average consumer price index (1967 = 100)	311.1	298.4	289.1	272.4	246.8

Under the current cost method, inventories and property, plant and equipment as of December 31, 1984 were valued at $1,329.0 million and $5,333.0 million, respectively, in average 1984 dollars.

SCHEDULE V - PROPERTY, PLANT AND EQUIPMENT

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
YEARS ENDED DECEMBER 31, 1984, 1983 and 1982
(In Thousands of Dollars)

COL. A	COL. B	COL. C	COL. D	COL. E-1	COL. E-2	COL. F
CLASSIFICATION	BALANCE AT BEGINNING OF PERIOD	ADDITIONS AT COST	RETIREMENTS	REPUBLIC COMBINATION	OTHER CHANGES - ADD (DEDUCT) - DESCRIBE	BALANCE AT END OF PERIOD
Year ended December 31, 1984:						
Land	$ 67,278	$ -	$ 100	$ 39,355	$ (164)- B (5,085)- C 125 - D (1,835)- E	$ 99,574
Buildings	166,952	-	22,285	278,699	886 - C (16,987)- E	407,265
Steel manufacturing facilities	2,507,833	23,285	637,561	2,685,574	(17,908)- A 120,792 - C (77,670)- D (71,367)- E	4,532,978
Mining	79,372	1,824	1,810	43,867	(328)- A 1,218 - C 25,708 - D	149,851
Transportation	41,160	149	709	66,376	949 - C (57,043)- E	50,882
Furniture, fixtures and other	9,004	292	1,837	20,226	1,399 - C (294) -D (398) -E	28,392
Construction in progress	46,632	112,156	4,347	61,113	(120,159)- C (11,966)- D (3,157)- E	80,272
	$2,918,231	$ 137,706	$ 668,649	$3,195,210	$ (233,284)	$5,349,214

See footnotes on page S-3.

SCHEDULE V - PROPERTY, PLANT AND EQUIPMENT (continued)

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
YEARS ENDED DECEMBER 31, 1984, 1983 and 1982
(In Thousands of Dollars)

COL. A	COL. B	COL. C	COL. D	COL. E	COL. F
CLASSIFICATION	BALANCE AT BEGINNING OF PERIOD	ADDITIONS AT COST	RETIREMENTS	OTHER CHANGES - ADD (DEDUCT) - DESCRIBE	BALANCE AT END OF PERIOD
Year ended December 31, 1983:					
Land	$ 69,687	$ -	$ 1,444	$ (151)- B (814)- E	$ 67,278
Buildings	182,171	-	5,260	900 - C (10,859)- E	166,952
Steel manufacturing facilities	2,327,553	19,900	43,999	(20,316)- A 288,923 - C (64,228)- E	2,507,833
Mining	86,312	-	2,102	(94)- A 878 - C (5,622)- D	79,372
Transportation	44,567	58	608	64 - C (2,921)- D	41,160
Furniture, fixtures and other	9,023	-	276	351 - C (94)- E	9,004
Construction in progress	146,481	200,394	6,818	(291,116)- C (2,309)- E	46,632
	$2,865,794	$ 220,352	$ 60,507	$ (107,408)	$2,918,231

See footnotes on page S-3.

SCHEDULE V - PROPERTY, PLANT AND EQUIPMENT (continued)

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
YEARS ENDED DECEMBER 31, 1984, 1983 and 1982
(In Thousands of Dollars)

COL. A	COL. B	COL. C	COL. D	COL. E	COL. F
CLASSIFICATION	BALANCE AT BEGINNING OF PERIOD	ADDITIONS AT COST	RETIREMENTS	OTHER CHANGES - ADD (DEDUCT) - DESCRIBE	BALANCE AT END OF PERIOD
Year ended December 31, 1982:					
Land	$ 76,314	$ -	$ 6,550	$ (175) - B 98 - C	$ 69,687
Buildings	185,529	-	5,831	2,473 - C	182,171
Steel manufacturing facilities	2,145,090	19,183	11,666	(21,990) - A 196,936 - C	2,327,553
Mining	164,265	4,211	80,841	(34) - A 4,021 - C (5,310) - D	86,312
Transportation	55,895	-	12,318	990 - C	44,567
Furniture, fixtures and other	9,110	-	860	773 - C	9,023
Construction in progress	138,022	214,250	500	(205,291) - C	146,481
	$2,774,225	$ 237,644	$ 118,566	$ (27,509)	$2,865,794

Notes:
A - Amortization charged to operations, primarily of mill rolls.
B - Depletion charged to operations.
C - Reclassifications between accounts.
D - Transfers or reclassifications to other balance sheet accounts, primarily to assets held for sale.
E - Transfers or sales to affiliates.

Amounts exclude the Company's energy products business segement which was divested in 1984.

SCHEDULE VI - ACCUMULATED DEPRECIATION, DEPLETION AND AMORTIZATION OF PROPERTY, PLANT AND EQUIPMENT

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
YEARS ENDED DECEMBER 31, 1984, 1983 and 1982
(In Thousands of Dollars)

COL. A	COL. B	COL. C	COL. D	COL. E-1	COL. E-2	COL. F
CLASSIFICATION	BALANCE AT BEGINNING OF PERIOD	ADDITIONS AT COST.	RETIREMENTS	REPUBLIC COMBINATION	OTHER CHANGES - ADD (DEDUCT) - DESCRIBE	BALANCE AT END OF PERIOD
Year ended December 31, 1984:						
Buildings	$ 72,928	$ 4,744	$ 19,696	$ 165,755	$ (155)- A 53 - B (12,796)- C	$ 210,833
Steel manufacturing facilities	1,032,471	129,504	563,955	1,214,818	(212)- A (28,238)- B (51,276)- C	1,733,112
Mining	53,608	4,708	1,388	33,576	20,221 - B	110,725
Transportation	22,438	3,237	532	3,131	(1,716)- C	26,558
Furniture, fixtures and other	6,416	1,588	1,490	9,824	367 - A 211 - B (204)- C	16,712
Total	$1,187,861	$ 143,781	$ 587,061	$1,427,104	$ (73,745)	$2,097,940
Year ended December 31, 1983:						
Buildings	$ 76,450	$ 3,090	$ 2,816	$ -	$ (3,796)- C	$ 72,928
Steel manufacturing facilities	1,038,493	57,480	32,342	-	(31,160)- C	1,032,471
Mining	53,030	4,307	1,743	-	(1,986)- C	53,608
Transportation	21,931	1,808	539	-	(762)- C	22,438
Furniture, fixtures and other	6,225	519	270	-	(58)- C	6,416
Total	$1,196,129	$ 67,204	$ 37,710	$ -	$ (37,762)	$1,187,861

See footnotes on page S-5.

SCHEDULE VI - ACCUMULATED DEPRECIATION, DEPLETION AND AMORTIZATION
OF PROPERTY, PLANT AND EQUIPMENT (continued)

LTV STEEL COMPANY, INC. AND SUBSIDIARIES
YEARS ENDED DECEMBER 31, 1984, 1983 and 1982
(In Thousands of Dollars)

COL. A	COL. B	COL. C	COL. D	COL. E	COL. F
CLASSIFICATION	BALANCE AT BEGINNING OF PERIOD	ADDITIONS AT COST	RETIREMENTS	OTHER CHANGES - ADD (DEDUCT) - DESCRIBE	BALANCE AT END OF PERIOD
Year ended December 31, 1982:					
Buildings	$ 76,195	$ 3,219	$ 2,964	$ -	$ 76,450
Steel manufacturing facilities	1,002,564	47,786	11,857	-	1,038,493
Mining	96,505	7,736	51,211	-	53,030
Transportation	28,736	2,294	9,099	-	21,931
Furniture, fixtures and other	6,197	516	488	-	6,225
Total	$1,210,197	$ 61,551	$ 75,619	$ -	$1,196,129

Notes:
A - Reclassifications between accounts.
B - Transfers or reclassifications to other balance sheet accounts.
C - Transfers or sales to affiliates.

Amounts exclude the Company's energy products business segment which was divested in 1984.

	1984	1983	1982
Depreciation charged to operations			
Credit to allowance - above	$143,781	$ 67,204	$ 61,551
Credits direct to assets (Schedule V)			
Amortization	18,236	20,410	22,024
Depletion	164	151	175
Total per consolidated statement of operations	$162,181	$ 87,765	$ 83,750

SCHEDULE VIII - VALUATION AND QUALIFYING ACCOUNTS

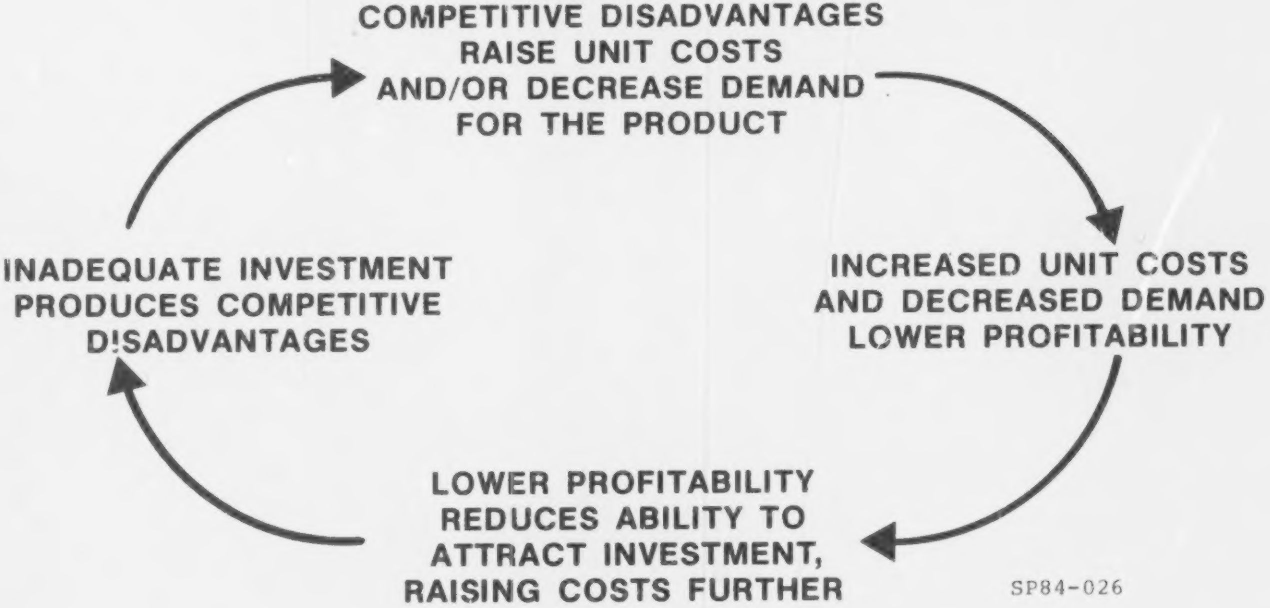
LTV STEEL COMPANY, INC. AND SUBSIDIARIES
YEARS ENDED DECEMBER 31, 1984, 1983 and 1982
(In Thousands of Dollars)

COL. A	COL. B	COL. C	COL. C	COL. D	COL. E
		ADDITIONS			
DESCRIPTION	BALANCE AT BEGINNING OF PERIOD	(1) CHARGED TO COSTS AND EXPENSES	(2) CHARGED TO OTHER ACCOUNTS--DESCRIBE	DEDUCTIONS DESCRIBE	BALANCE AT END OF PERIOD
Year ended December 31, 1984:					
Estimated liability for plant closing costs (noncurrent)	$ 1,659	(A)	(A)	(A)	$ 71,733
Year ended December 31, 1983:					
Estimated liability for plant closing costs (noncurrent)	$ 25,920	(A)	(A)	(A)	$ 1,659
Year ended December 31, 1982:					
Estimated liability for plant closing costs (noncurrent)	$ 2,494	(A)	(A)	(A)	$ 25,920

Note A: The above beginning and ending balances are insignificant, and pursuant to the instructions to Schedule VIII in Rule 12-09 of Regulation S-X, the data for Columns C and D have been omitted.

Amounts exclude the Company's energy products business segment which was divested in 1984.

THE LIQUIDATION SPIRAL



COMPETITIVE DISADVANTAGES
RAISE UNIT COSTS
AND/OR DECREASE DEMAND
FOR THE PRODUCT

INCREASED UNIT COSTS
AND DECREASED DEMAND
LOWER PROFITABILITY

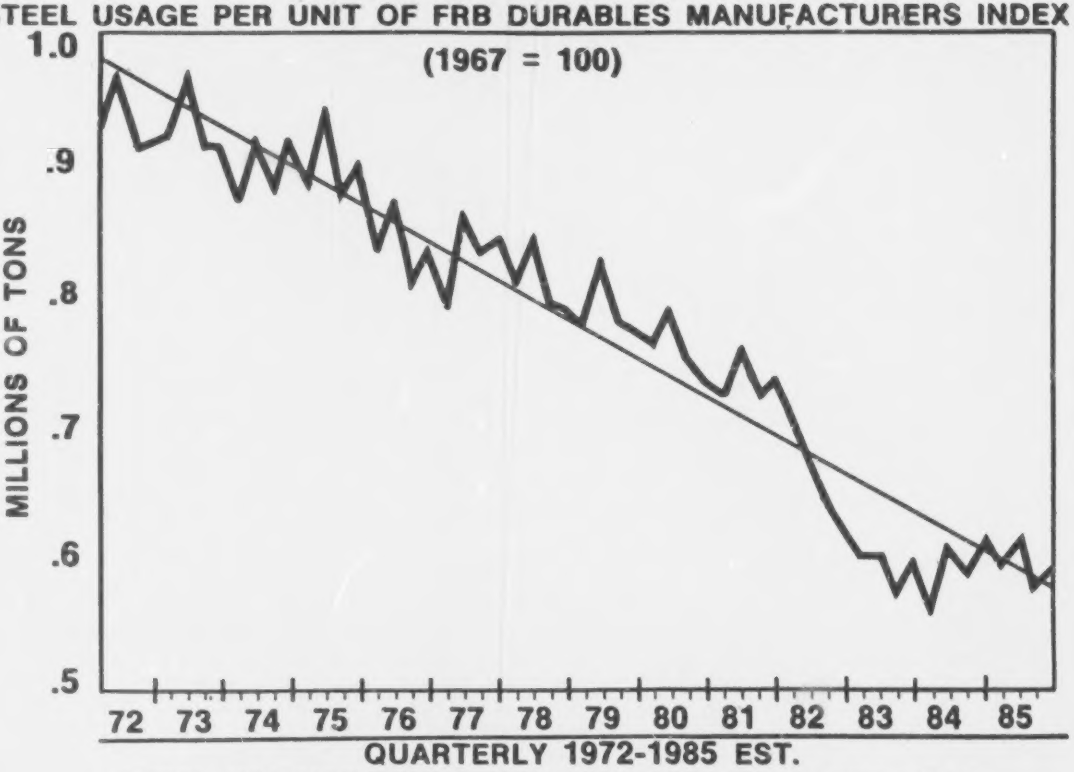
LOWER PROFITABILITY
REDUCES ABILITY TO
ATTRACT INVESTMENT,
RAISING COSTS FURTHER

INADEQUATE INVESTMENT
PRODUCES COMPETITIVE
DISADVANTAGES

SP84-026

EXHIBIT 1

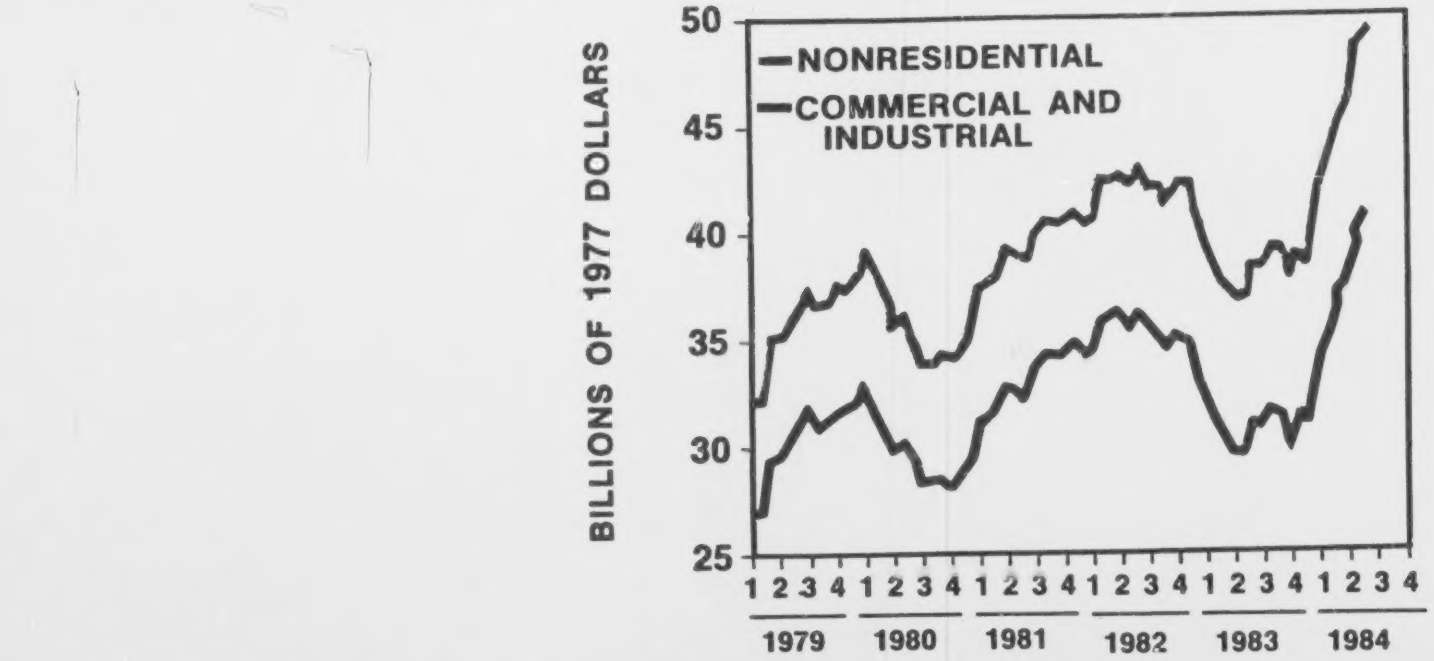
STEEL INTENSITY



STEEL INTENSITY IS FALLING BY ABOUT 4% PER YEAR

CP85-020

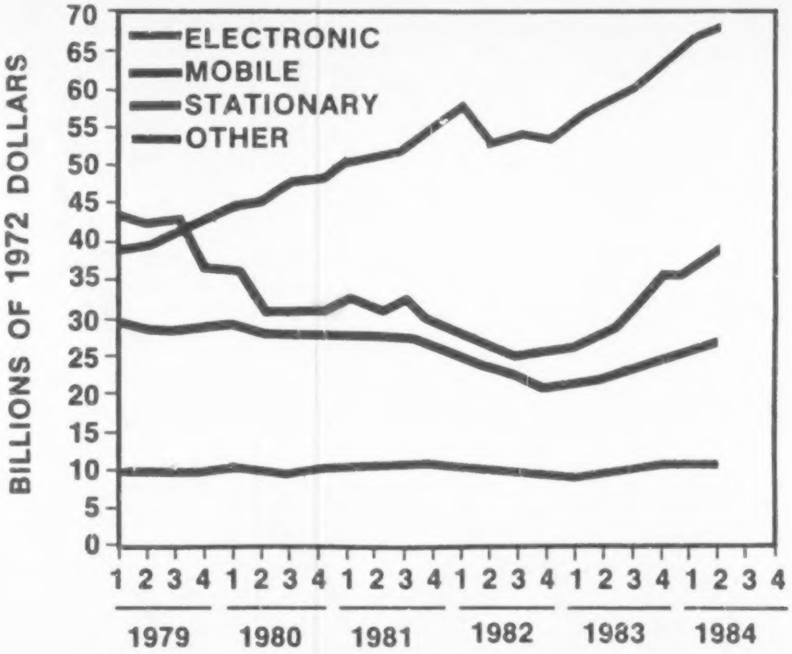
EXHIBIT 2



SPENDING FOR NON-RESIDENTIAL AND FOR COMMERCIAL AND INDUSTRIAL CONSTRUCTION IS INCREASING

CP85-026

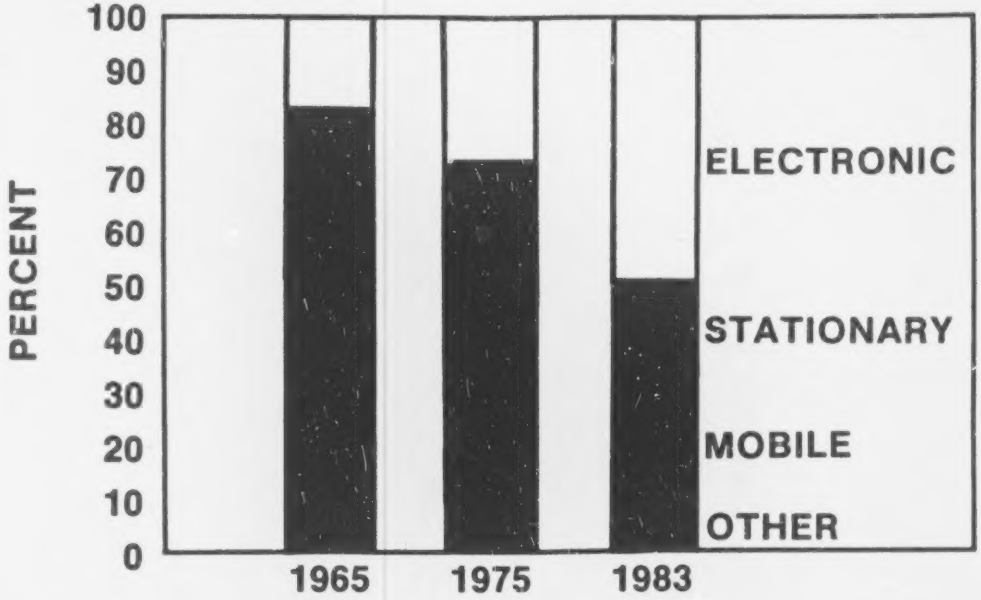
EXHIBIT 3



SPENDING FOR STEEL-INTENSIVE CAPITAL CAPITAL EQUIPMENT HAS DECLINED OVER THE LAST FIVE YEARS

CP85-024

EXHIBIT 4

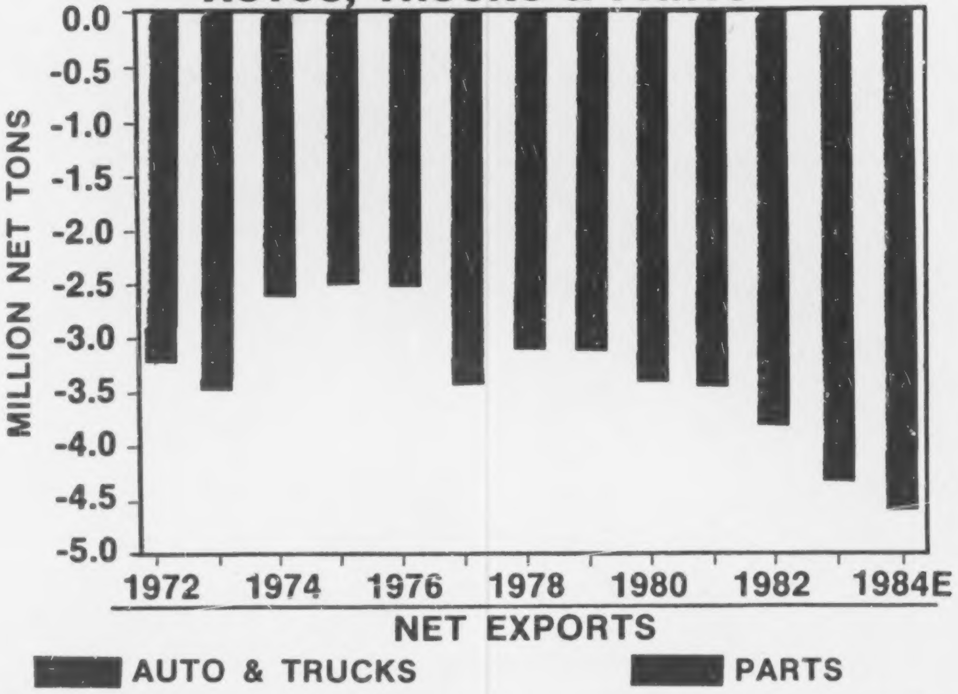


DISTRIBUTION OF TOTAL SPENDING FOR PRODUCERS' DURABLE EQUIPMENT HAS MOVED AWAY FROM HEAVY EQUIPMENT AND TOWARD ELECTRONICS, COMPUTERS AND SOFTWARE

CP85-025

EXHIBIT 5

INDIRECT STEEL TRADE
AUTOS, TRUCKS & PARTS

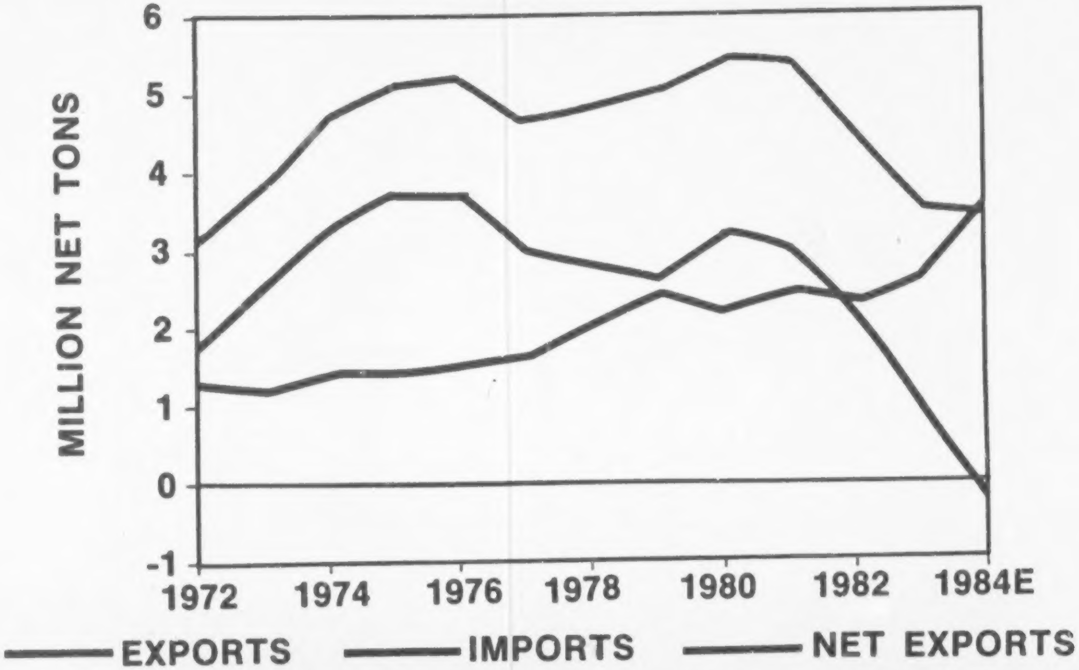


NET EXPORTS OF CARS, TRUCKS, AND PARTS NEGATIVE AND GETTING MORE SO

CP85-022
EXHIBIT 6

INDIRECT STEEL TRADE

MACHINERY



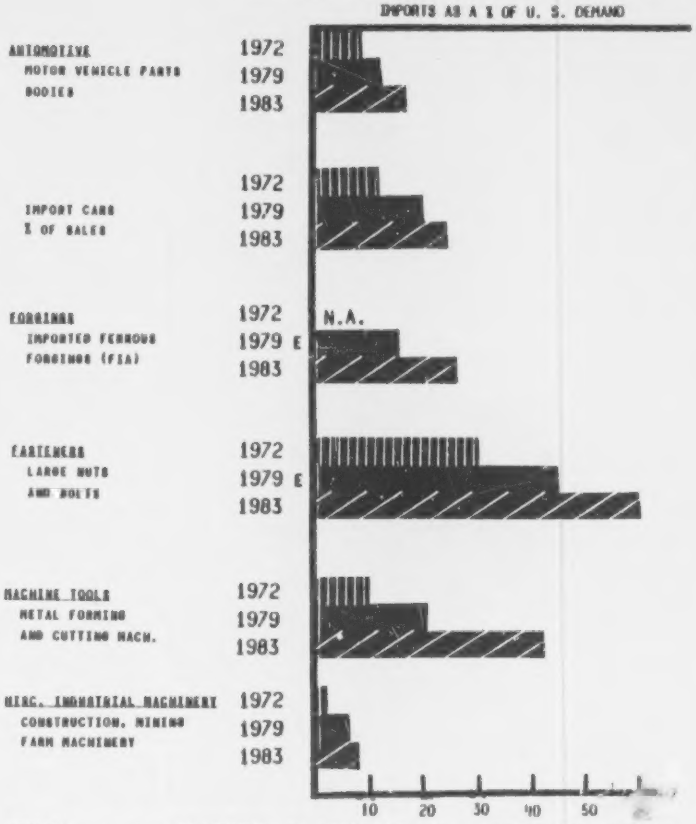
NET EXPORTS OF MACHINERY HAVE DECREASED
AND ARE NOW NEGATIVE

CP85-023

EXHIBIT 7

HOT ROLLED BAR DEMAND

STRUCTURAL CHANGES HAVE TAKEN PLACE IN KEY BAR MARKETS



OTHER FACTORS

- WEIGHT REDUCTION THROUGH
  - REDESIGN/DOWNSIZING
  - MATERIAL SUBSTITUTION

- OVERSEAS PRODUCTION OF PARTS AND COMPONEN

- IMPORTED FORGINGS HAVE INCREASED SHARPLY
- FIA TRADE ASSOCOCIATION ESTIMATES WITH VALUE OF FORGINGS IN IMPORTED COMPONENTS IMPORTS ARE CLOSER TO 40%

- MAJOR PENETRATION IN LARGE NUTS AND BOLTS
- DEMAND LOWERED BY IMPORTED COMPONENTS

- MACHINE TOOLS MANUFACTURERS ARE FORMING AFFILIATIONS WITH FOREIGN PRODUCERS
- U. S. MANUFACTURERS IMPORTED FOREIGN MACHINES AND ADDING ELECTRONICS

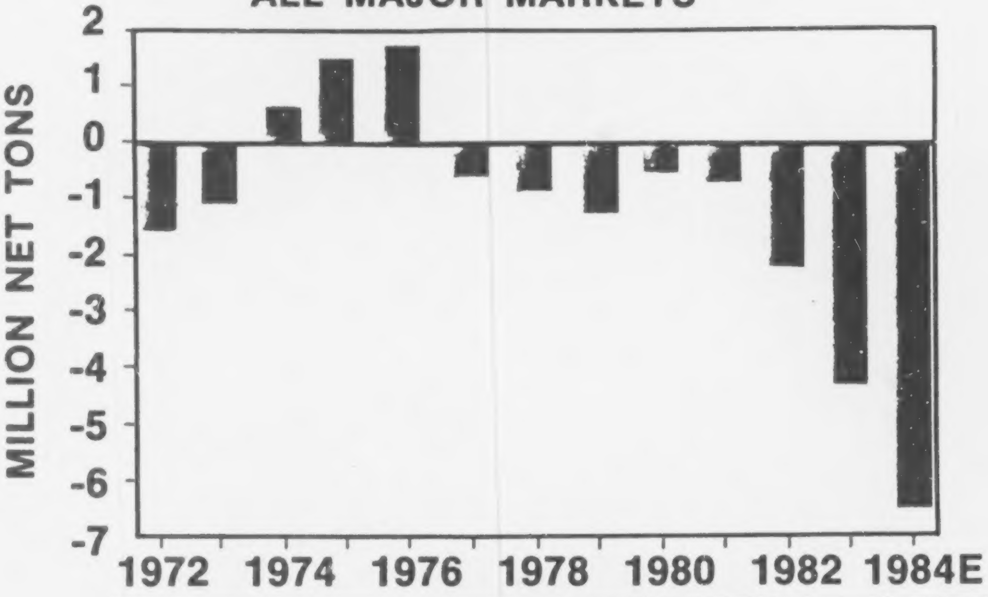
- PRODUCTION OF SMALL EQUIPMENT HAS BEEN SHIFTED OVERSEAS
- FOREIGN PRODUCERS BECOMING MORE AGGRESSIVE IN THE U. S. MARKET.

EXHIBIT 8

SOURCE: U. S. DEPARTMENT OF COMMERCE DATA, TRADE ASSOCIATIONS, AND ECONOMIC DIVISION ESTIMATES.

INDIRECT STEEL TRADE

ALL MAJOR MARKETS



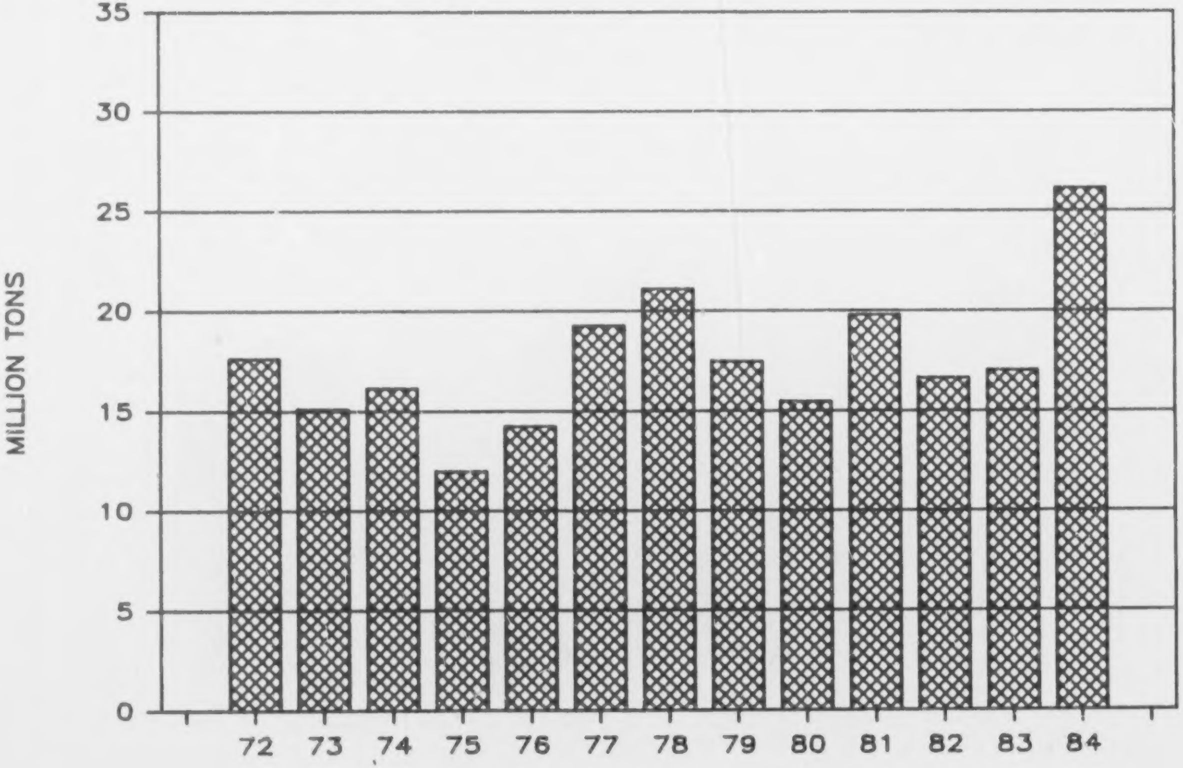
NET EXPORTS

TOTAL NET EXPORTS FOR ALL MAJOR STEEL MARKETS IS NEGATIVE AND GETTING MORE SO

CP85-021

EXHIBIT 9

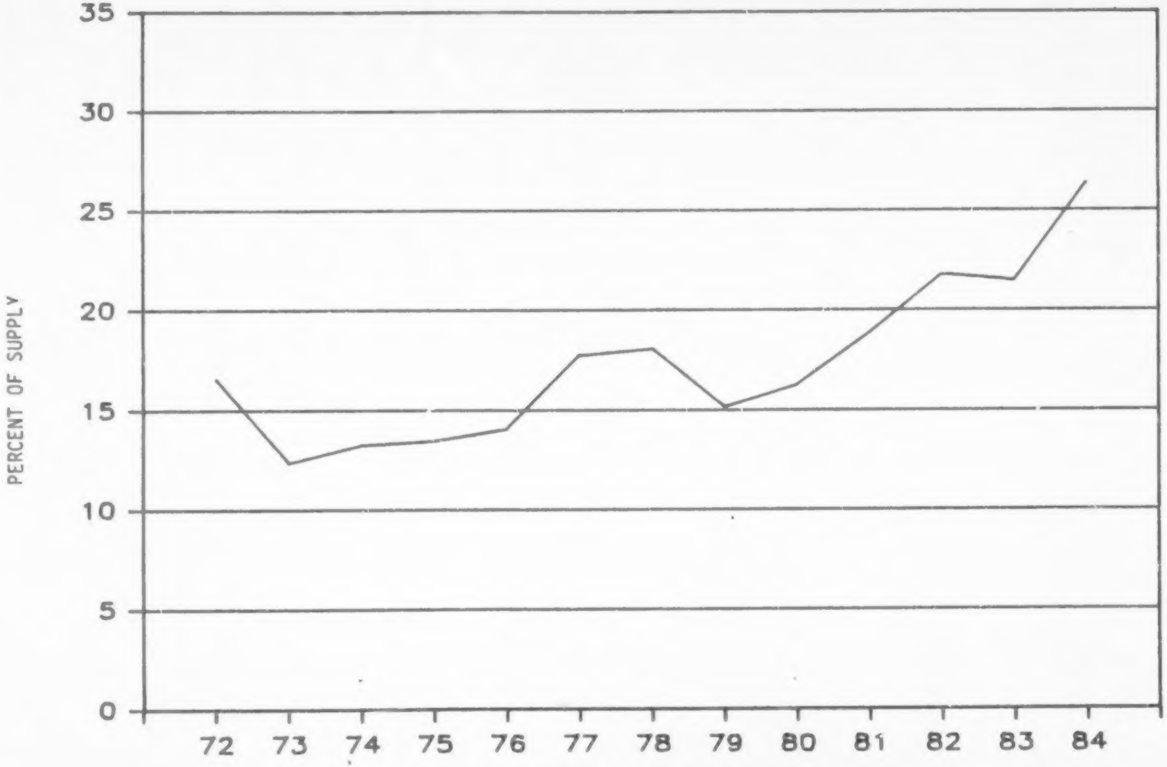
IMPORTS OF STEEL MILL PRODUCTS



SOURCE: U.S. DEPT COMMERCE

EXHIBIT 10

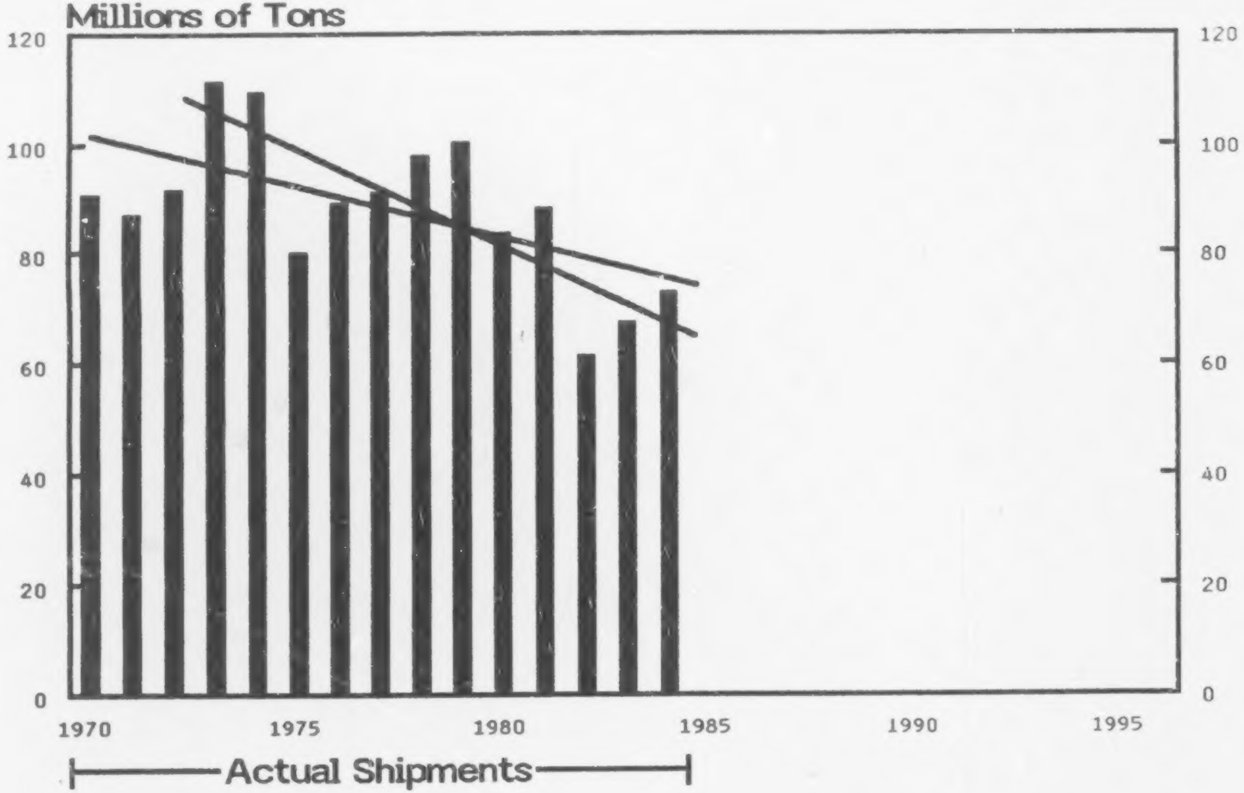
IMPORTS OF STEEL MILL PRODUCTS



SOURCE: U.S. DEPT COMMERCE

EXHIBIT 11

Steel Industry Shipments - Actuals & Trendlines



Pittsburgh Post Gazette
May 9, 1984

WEDNESDAY, MAY 9, 1984

Steel panel issues report

By Jane Blotzer
Post-Gazette Washington Correspondent

WASHINGTON — The Steel Advisory Committee yesterday called on the Labor Department to set aside a share of the Job Training Partnership funds to be used to help steel workers who have permanently lost their jobs.

The report, issued by the employment, productivity and adjustment subcommittee, also proposed the creation of a labor-management-government panel to help administer a "model steel adjustment plan."

"What we're doing is setting up a mechanism to respond to the tremendous problems faced by steelworkers," said Jack Sheehan, a subcommittee member and United Steelworkers lobbyist. "We're saying you can't look at the whole unemployment compensation system, you must take a sectoral approach."

The Reagan administration, which disbanded the Steel Tripartite Advisory Commission soon after taking office, has long resisted such an economic approach.

The establishment last summer of the Steel Advisory Committee was Reagan's first concession to those who insisted that the steel industry has special problems that merit separate consideration.

The language of yesterday's report, which met with administration approval, reinforced that position.

Among other things, the report stated, "Given the unique nature of the unemployment in this industry and particularly its community impact, consideration should be given to alternative national approaches to employee and community adjustment."

It also called for technical and administrative assistance to be routinely available "given the special priority of this industry."

Subcommittee members agreed that the recommendations will not provide immediate help to laid-off workers.

David Carroll, general manager for personnel at Jones & Laughlin Steel and a subcommittee member, said the main value of the report is to refocus attention on the problems. "It emphasizes that labor and management must continue to work on their problems and that the federal government can help by providing incentives."

The committee also endorsed the concept of labor-management participation teams; recommended consideration of profit sharing and work sharing; and called for a maximum effort in job search assistance and retraining.

F-Tripartite Binder

D10 Pgh. Press 5/8/84

Report suggests ways to reduce steel layoffs

By Kathy Kiely

The Pittsburgh Press

WASHINGTON — A government-sponsored committee that is trying to find ways to help the troubled steel industry is flirting with the idea of using innovative work-sharing programs to minimize layoffs.

At a meeting today, representatives of the United Steelworkers of America, Reagan administration officials and steel company executives endorsed a report that tentatively recommends plants consider reducing layoffs by using a combination of shorter work weeks and unemployment insurance.

The report suggests that instead of making drastic reductions in employment, steel executives consider retaining more workers at shorter hours and supplementing their employees' reduced paychecks with unemployment insurance benefits.

That recommendation is bound to be controversial. It cuts against the grain of union seniority systems and, according to some government experts, it likely would increase the cost of unemployment insurance programs.

Members of the group that voted in favor of the recommendation said they expect resistance but want to try to overcome it.

"We think it's worth experimenting with," said Jack Sheehan, legislative director of the USW.

Robert Searby of the Department of Labor said the idea of paying unemployment benefits as salary supplements to steelworkers whose hours have been reduced already has aroused some opposition in the Reagan administration.

"There is disagreement . . . as to whether that's appropriate to the unemployment insurance system," he said.

Nonetheless, Searby said the Reagan administration should at least consider the idea.

"We wanted to flag it to the highest cabinet offices — that this is one of the innovative ideas that can be used," he said.

The group that approved the work-sharing plan, along with a number of less controversial recommendations to ease layoff problems in the steel industry, is a subcommittee of the Steel Advisory Committee, a joint labor, management and government council assigned to draft a master plan for aiding the steel industry.

Today's recommendations will have to be approved by the full committee before they can take effect.

Among the other proposals that the subgroup recommended today are:

- The creation of an ad hoc labor-management-government committee to coordinate government aid programs for communities affected by plant shutdowns;
- The creation of a special steel account in the budget of the Jobs Training Partnership Act, a Reagan administration program to retrain displaced workers.

Subcommittee members argued that the steel industry should receive a lion's share of JTPA assistance. "The steel industry needs more work than any other industry," said David Carroll of Jones & Laughlin Steel Corp.

The subcommittee noted that labor costs in the steel industry are high — due largely, it said, to rising costs of health care and health insurance — and recommended that labor and management explore innovative ways of compensating workers, such as profit-sharing, in contract negotiations.

APPENDIX Q

Mr. Walter Bachowski
Director - District 20
United Steelworkers of America
390 Ohio River Boulevard
Baden, PA 15005

Dear Mr. Bachowski:

In re: Joint Company-Union Community Training Program

This will confirm our understanding that effective with the date of the 1983 Agreement covering the Midland Plant and for a period ending on December 31, 1984, the Company will contribute seventy-five cents ($.75) for each hour worked by an employee covered by such Labor Agreement to a special Community "Training Fund" and such monies will be distributed monthly to the Fund. The purpose of the fund will be to provide a program of training (or retraining as the case may be) for former employees of Crucible, Inc. and other residents of the communities impacted by the closing of the Crucible Plant.

The Company and Union will each appoint a Co-Chairman for this program and four (4) members from each party whose duty it will be to immediately begin arranging for discussions with appropriate representatives of Federal, State and Local governments and educational institutions to:

1. Formulate a comprehensive Training Program in occupations that will provide the best opportunity for full time employment.
2. Obtain additional funding for the program.

The Committee shall prepare the rules and procedures for the Program. Representatives of Federal, State and Local Governments, and business, education and community organizations will be asked to serve on an advisory board to the Committee.

The legitimate expenses for the members of the Committee shall, except as otherwise agreed to, be paid out of the "Training Fund" when those expenses have been approved by the Co-Chairmen of the Committee.

The Committee shall be responsible for overseeing the operation of the Program and the disbursements of funds. To enable the Committee to begin its work, the Company will advance the sum of $10,000 to the Fund promptly after the effective date of this Agreement. That sum will be recouped from contributions owing to the Fund in 1984 in accordance with arrangements to be made by the Co-Chairmen of the Committee.

APPENDIX Q (Continued)

The parties (Company and Union) shall notify each other (by letter to the Company and Union Chairmen of these negotiations) on or before February 10, 1983 as to the selection of members of the Committee and Co-Chairmen. The members of the Committee, once appointed, shall serve for the duration of the program except as they voluntarily leave the Committee.

Very truly yours,

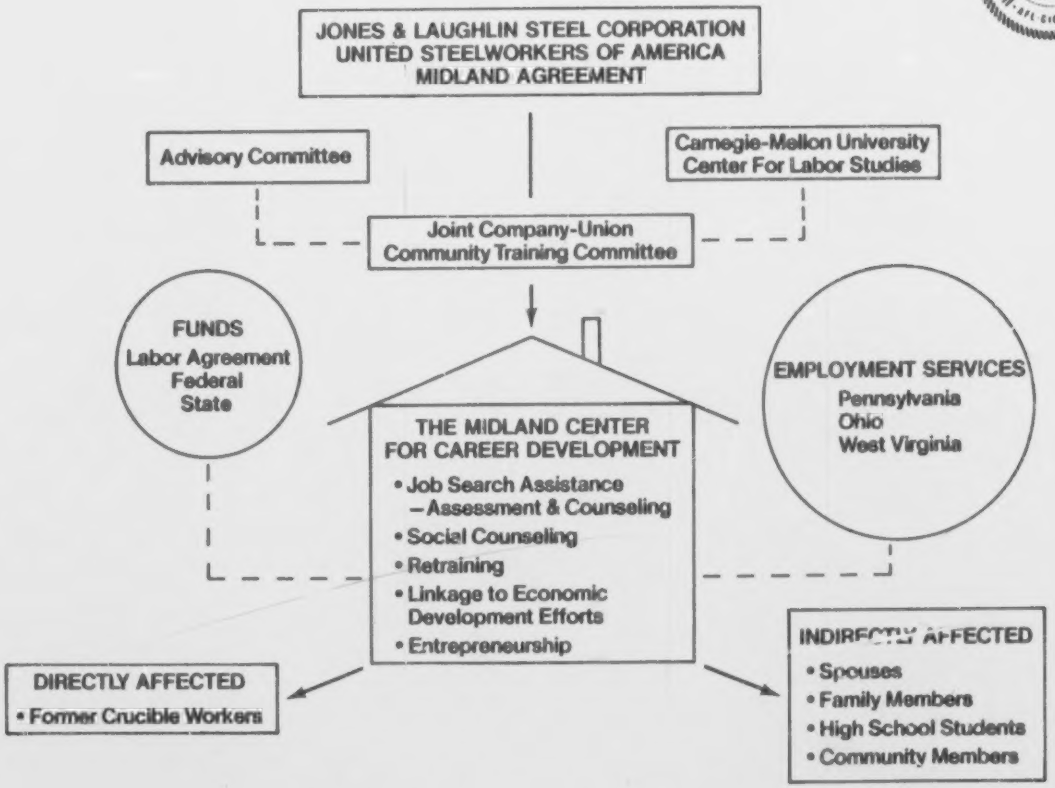
JONES & LAUGHLIN STEEL CORPORATION

A. C. TREMAIN
General Manager - Labor Relations

CONFIRMED:

Walter Bachowski
Director - District 20

LTV Steel Company


JONES & LAUGHLIN STEEL CORPORATION
UNITED STEELWORKERS OF AMERICA
MIDLAND AGREEMENT
Advisory Committee
Carnegie-Mellon University Center For Labor Studies
Joint Company-Union Community Training Committee
FUNDS
Labor Agreement
Federal
State
THE MIDLAND CENTER FOR CAREER DEVELOPMENT
• Job Search Assistance
– Assessment & Counseling
• Social Counseling
• Retraining
• Linkage to Economic Development Efforts
• Entrepreneurship
EMPLOYMENT SERVICES
Pennsylvania
Ohio
West Virginia
DIRECTLY AFFECTED
• Former Crucible Workers
INDIRECTLY AFFECTED
• Spouses
• Family Members
• High School Students
• Community Members

The MIDLAND CENTER FOR CAREER DEVELOPMENT

PROGRAM SPONSORS: United Steelworkers of America, Local 1212, and Jones & Laughlin Steel Corporation

FUNDING:	Federal JTPA (Secretary's Discretionary Fund)	$1,100,000
	+ Pennsylvania JTPA	$ 429,000
	+ Ohio JTPA	$ 572,000
	+ West Virginia JTPA	$ 99,000
	++ Private Sector Initiatives (Discretionary Funding)	$ 79,300
	* Community Training Fund	$ 250,000
	TOTAL:	$2,529,300

+ State JTPA Title III funds are dedicated 100 percent to re-employment and closely related services including counseling, job search instruction, testing and assessment, retraining, job development and placement and relocation assistance. Administrative expenses, planning and survey costs and monies for the medical clinic are funded by federal and local contributions.

++ 100 percent funding for job search efforts.

* J&L contributes 75 cents to the Community Training Fund for each manhour worked at its Midland plant through December 1984. In addition, Local 1212 and J&L support The Midland Center through inkind contributions of space, equipment and services.

ORGANIZATION:

The Midland Center for Career Development is a joint project of the United Steelworkers of America Local 1212 and the Jones & Laughlin Steel Corp. to help more than 4,000 dislocated steelworkers and their families face the challenge of seeking new employment in today's tight job market.

The Midland Center was created in 1983 as part of the collective bargaining agreement between Local 1212 and J&L, when the steelmaker's parent firm, LTV Corp., purchased the closed Crucible specialty steel plant from Colt Industries, Inc.

The program is governed by the 14-member Joint Company-Union Community Training Committee, with representatives from Local 1212, J&L and the project director. The board is responsible for administering the Community Training Fund, as well as, overseeing all activities associated with The Midland Center.

The Joint Committee has also established a Community Advisory Committee, composed of local and national legislators, businessmen, educators, labor representatives and civic leaders. The committee's prime responsibilities are to provide community imput in to programs, and to serve as liasons between the joint committee and government and private agencies associated with the center.

Members of both boards have volunteered their services to supplement the work of the small full-time staff. One member of the joint committee, who has advanced degrees in counseling services, spends several hours each week at The Midland Center as a career counselor. The manager of the Ohio Bureau of Employment Services office in East Liverpool, who serves on the advisory committee, also conducts workshops to explain what benefits, training and job search services are available to help the unemployed.

The project director oversees the daily operation of The Midland Center, which also employs two classroom instructors, a public relations director and a secretary. Additional staff members are to be added in the near future, including a resource center facilitator, a job development/outreach specialist, two career/stress counselors and a secretary.

The Pennsylvania Job Service supplements the full-time staff by providing an employment/veterans' benefits counselor each Wednesday.

Additional staff support is provided on a part-time basis by union outreach workers. The outreach workers were first used as field examiners for a needs assessment survey of former Crucible employees. The outreach personnel continue to do monthly updates on participants who have completed the job search portion of the program.

BACKGROUND:

The mill employed 4,300 hourly workers at its peak in 1979, with the first wave of permanent layoffs coming in 1980-81 as outdated blast furnaces were replaced with ultra-high-powered electric units. Shortly after this time, demand for specialty steel products fell precipitously low and eventually resulted in the closing of the plant in late 1982.

Employment at the steel mill has gradually increased to the current level of roughly 300 hourly and 80 salaried workers. Although modest growth is expected, significant expansion is unlikely, leaving some 4,000 former Crucible workers permanently displaced from the mill.

In addition to the plant closing, these workers face a bleak labor market in the surrounding tri-state area. Midland is located northwest of Pittsburgh in a largely rural section of Beaver County, near the Ohio and West Virginia borders. The area has experienced exceptionally high unemployment for the past two years, with rates as high as 22 percent.

GOALS/SUPPORTING ACTIVITIES:

A.) To maximize the participation of former Crucible employees at the center and to make all terminated employees and their families aware of the adjustment and re-employment services available.

-- Employee needs survey administered by Carnegie-Mellon University's Center for Labor Studies in cooperation with Local 1212 of the USWA and the Human Resources Development Institute of the AFL-CIO.

-- Continuing outreach effort to 4,000 former employees sponsored by Local 1212, with the assistance of HRDI and coordinated with the employee needs survey.

B.) To place job seeking participants in unsubsidized employment at wage levels commensurate with their skills, abilities and the labor market, and to prepare an employability development plan for each worker, suited to his skills and abilities.

-- Individual career and vocational counseling aimed specifically at helping each participant develop a re-employment plan.

-- Formal testing and assessment services will be available to all participants, with individual counseling to interpret scores and develop appropriate course of action.

-- Job development and labor exchange services will be organized to provide timely information on available jobs in the tri-state area so individuals can plan with some realistic knowledge of employment options.

C.) To contact at least 400 employers for job opportunities within and outside the tri-state area to match the skills and needs of participants at The Midland Center.

-- The Carnegie-Mellon study examined the skills and needs of former Crucible employees, and the tri-state labor market to identify growth industries.

-- The center will feature an ongoing job development program focusing on employment and economic development in the tri-state, including Midland, Pittsburgh, Youngstown and the Akron-Canton areas. This is currently being done three days per week, and will be expanded to a full-time postion in the near future.

-- The center works closely with employment service offices throughout the area to ensure notification of job listings suitable for participants. Local and national job openings listed with the job services are available on microfiche at the center.

D.) To place at least 60 percent of participants in unsubsidized jobs at an average wage of at least $5 per hour.

-- All re-employment services at The Midland Center contribute directly to this goal. These include career and vocational counseling, job search workshops, job clubs, the resource center, testing and assessment services, job development and placement services, all retraining and education services and relocation assistance.

-- The center works closely with area Private Industry Councils and employment service offices to maximize placements.

-- Support services, such as personal and financial counseling and emergency financial support, contribute indirectly to this goal.

-- Follow-up counseling, retraining and job placement services will be provided after the center closes for individuals who have not found jobs.

E.) To help workers cope with the shock of termination and subsequent personal problems such as financial, marital, family and health-related problems.

-- Personal and financial counseling/referrals; job clubs to provide peer support in dealing with frustration and personal problems; stress counseling; and emergency financial assistance.

-- Health clinic planned to provide low-cost medical services for dislocated workers and their families. JTPA Title III funds will not be used for this project.

DEMOGRAPHICS:

The former Crucible employees typically worked at the plant for most of their adult lives, serving an average of 15-20 years. Researchers from the Center for Labor Studies at Carnegie-Mellon University in Pittsburgh recently completed a survey for The Midland Center using a representative sample of 518 of the 4,300 former employees. (Survey coordination detailed in GOALS/SUPPORTING ACTIVITIES section of this document.)

A profile of the "typical" displaced worker from the former Crucible plant shows him to be a white, married father of two, with a high school education, five-to-10 years left to pay on a home mortgage ... no job and few benefits.

Approximately 52 percent of the 4,300 former Crucible employees reside in Ohio, 39 percent in Pennsylvania, and 9 percent in West Virginia.

PROGRAM FEATURES:

The Midland Center offers displaced workers extensive training in current job search techniques, resume preparation and support services. Job search workshops include one week of classroom instruction at Midland Lincoln High School, followed by two weeks of structured resource center work at the union hall.

Classroom instruction began Sept. 26, 1983, and includes self-assessment exercises to determine personality characteristics and skills helpful in the job search, as well as, telephone canvassing techniques, videotaped mock interviews and practice completing job applications.

The resource center is equipped with telephones (WATS lines), Yellow Page and industrial directories, labor market reviews, word processors, newspapers from areas across the country, state and national job service listings on microfiche and other valuable reference materials. Participants are shown how to use these resources to their best advantage in the job search process. After completing the job search workshop, participants are encouraged to make unlimited use of the resource center services/facilities, including resume/cover letter preparation, career counseling, and social service referrals.

The allocation of some $2.2 million in state and federal JTPA funding has allowed The Midland Center to aggressively enter the retraining phase of the project. Some 150 participants are enrolled in training programs throughout the tri-state area, including Center-sponsored computer literacy classes at the Pennsylvania State University Beaver Campus in Monaca, and the Kent State University branch in East Liverpool, Ohio. The three-part program covers microcomputer operation and programming in BASIC language; word processing; and business applications of the microcomputer.

The Center is now studying proposals from a variety of educational institutions in the tri-state area to provide the technical retraining courses targeted as growth areas in the Carnegie-Mellon study. Several short-term courses are expected to begin soon, including business machine repair, electronics and general maintenance programs. Additional programs will be added as classroom facilities and qualified instructors become available.

Staff members continue to contact employers within a 75-mile radius of Midland to update information on anticipated openings and special training needs. More than 400 employers are expected to be contacted in fiscal year 1984. Participant files are stored and cross-referenced according to skills, background, etc., on one of two computer systems to maximize pre-screening and referral services for prospective employers. The second computer system is used largely for administrative/communications aspects of the project.

RESULTS:

TIME SPAN: Sept. 26, 1983 (beginning of first classroom session) and May 31, 1984.

PLACEMENTS: To date, 126 of the 422 completing job search workshops have found new jobs. An additional 150 participants are enrolled in training programs, for a placement rate of 65.4 percent.

PROJECT STATUS: The Midland Center anticipates serving approximately 2,500 unemployed steelworkers and an additional 700 family members and others adversely affected by the closing of the Crucible plant. A placement rate of 60 percent is projected over the two-year government funding period. The estimated cost per placement is $1,374, with retraining, and $832, without retraining.

PROFILE OF LAID-OFF CRUCIBLE STEEL WORKERS

Prepared by
Center for Labor Studies
School of Urban and Public Affairs
Carnegie-Mellon University
Pittsburgh PA

For
Midland Joint Company-Union Community Training Committee
Midland PA

The following tables are excerpted from an analysis of results of a survey conducted by the Center for Labor Studies for the Midland Joint Company-Union Community Training Committee. The survey was conducted between December 14, 1983 and January 20, 1984. A sample of 518 was drawn from a population of approximately 4300 displaced workers, formerly employees of the Midland Crucible Steel Plant.

A complete version of the survey results is available through the Center for Labor Studies.

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SECTION I: PERSONAL CHARACTERISTICS

I.A DEMOGRAPHICS

Table I.A.1: STATE OF RESIDENCE

		ALL 100.0%
	N	518
OHIO	287	55.4
PENNA	183	35.3%
W VA	48	9.3%

Table I.A.2: SEX OF RESPONDENT

		ALL 100.0%
	N	518
MALE	486	93.8%
FEMALE	32	6.2%

Table I.A.3: RACE OF RESPONDENT

		ALL 100.0%
	N	518
WHITE	478	92.3%
BLACK	31	6.0%
HISPANIC	9	1.7%

Table I.A.4: AGE OF RESPONDENT

		ALL 100.0%
	N	518
Under 25	7	1.4%
25 to 29	69	13.3%
30 to 34	95	18.3%
35 to 39	73	14.1%
40 to 44	76	14.7%
45 to 49	67	12.9%
50 to 54	52	10.0%
55 to 59	51	9.8%
60 and up	28	5.4%

Table I.A.5: EDUCATION OF RESPONDENT

		ALL 100.0%
	N	516
8	20	3.9%
9	10	1.9%
10	20	3.9%
11	12	2.3%
12	360	69.8%
13	33	6.4%
14	37	7.2%
15	14	2.7%
16	10	1.9%

I.B FAMILY COMPOSITION

Table I.B.1: MARITAL STATUS

		ALL 100.0%
	N	518
NO SPOUSE	76	14.7%
SPOUSE	442	85.3%

Table I.B.2: TOTAL NUMBER OF DEPENDENTS
(Including respondent)

		ALL 100.0%
	N	518
1	50	9.7%
2	110	21.2%
3	99	19.1%
4	153	29.5%
5	73	14.1%
6	18	3.5%
7	10	1.9%
8	3	0.6%
9	2	0.4%

I.C HOUSING

Table I.C.1: TYPE OF HOUSING

		ALL 100.0%
	N	517
RENT	87	16.8%
OWN	406	78.5%
LIVE WITH OTHERS	24	4.6%

Table I.C.2: TIME TO GO ON MORTGAGE
(Respondents owning or buying home only)

		ALL 100.0%
	N	357
Paid off	66	18.5%
1-5 yrs	82	23.0%
6-10 yrs	68	19.0%
11-15 yrs	62	17.4%
16-20 yrs	46	12.9%
21-25 yrs	29	8.1%
26+ yrs	4	1.1%

SECTION II: EMPLOYMENT HISTORY

Table II.A: MILITARY SERVICE

		ALL 100.0%
	N	516
YES	266	51.6%
NO	250	48.4%

No females were veterans

Table II.B: LENGTH OF SERVICE AT CRUCIBLE

		ALL 100.0%
	N	518
Under 6 yrs	71	13.7%
6-10 yrs	154	29.7%
11-15 yrs	44	8.5%
16-20 yrs	81	15.6%
21-25 yrs	44	8.5%
26-30 yrs	46	8.9%
31-35 yrs	47	9.1%
36+ yrs	31	6.0%

Table II.C.1: NUMBER OF MONTHS SINCE CRUCIBLE LAYOFF

		ALL 100.0%
	N	509
0-12 mo	10	2.0%
13-18 mo	117	23.0%
19-24 mo	244	47.9%
25-30 mo	77	15.1%
31-36 mo	46	9.0%
37+ mo	15	2.9%

Table II.C.2: REPORTED ELIGIBILITY FOR TRA AND TAA BENEFITS

		ALL 100.0%
	N	515
YES	145	28.2%
NO	202	39.2%
DON'T KNOW	168	3[illegible]%

Table II.C.3: NEW JOB REPORTED

		ALL
		100.0%
	N	517
YES	114	22.1%
NO	403	77.9%

Table II.C.4: SUCCESS IN FINDING A NEW JOB

		ALL
		100.0%
	N	518
F/T, perm	18	3.5%
F/T, temp	5	1.0%
F/T, unspec	15	2.9%
P/T, perm	3	0.6%
P/T, temp	11	2.1%
P/T, unspec	23	4.4%
Unspec perm	4	0.8%
Unspec temp	20	3.9%
No details	14	2.7%

SECTION III: CURRENT STATUS OF WORKERS

. SOURCES OF INCOME

Table III.A: PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC TYPES OF PENSIONS, UNEMPLOYMENT/RETRAINING BENEFITS, AND TRANSFER PAYMENTS

		ALL
		100.0%
	N	516
Cruc pens	161	31.2%
Soc secur	19	3.7%
Other pens	4	0.8%
Unemploymt	39	7.6%
SUB	10	1.9%
TAA	13	2.5%
TRA	5	1.0%
VA eductn	2	0.4%
Food stamps	100	19.4%
Welfare	46	8.9%
Medicaid	40	7.7%
S&S relief	7	1.4%
benefits, no job	116	22.5%

III.B MEDICAL INSURANCE

Table III.B.1: TYPES OF CURRENT MEDICAL INSURANCE COVERAGE REPORTED

		ALL
		100.0%
	N	518
Crucible	173	33.4%
Spouse	59	11.4%
Personal	59	11.4%
Employer	44	8.5%
Medicaid	40	7.7%
None	151	29.2%

III.C FAMILY SUPPORT

Table III.C.1: PRINCIPAL SOURCE OF FAMILY INCOME

)RMERLY		ALL
		100.0%
	N	514
YES	481	93.6%
NO	33	6.4%

CURRENTLY		ALL
		100.0%
	N	513
YES	371	72.3%
NO	142	27.7%

Table III.C.2: SPOUSE SEEKING EMPLOYMENT

		ALL
		100.0%
	N	423
YES	200	47.3%
NO	223	52.7%

SECTION IV: TRAINING

Table IV.A: PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC TYPES OF FORMAL TRAINING AND ON-JOB TRAINING

		ALL
		100.0%
	N	518
College	81	15.6%
Technical	54	10.4%
Vocational	86	16.6%
Trade	27	5.2%
Other	16	3.1%
Apprentice	18	3.5%
On-job	144	27.8%
Military	166	32.0%

NEEDS QUESTIONNAIRES

	OHIO	PA	W. VA
TOTALS *	280	178	45
Brush up	223	111	17
Retraining	270	145	17
Entrepreneurship	175	104	15
Assistance in finding a job	258	161	26
Relocation assistance	89	76	10
Benefits	103	63	8
Child care	20	17	0
Health	99	58	6
VA	57	63	8
TRA	151	83	4
TAA	135	82	5
Bills	12	8	0
Stress	20	10	0
Legal	38	13	0
Utility	88	45	5
Food	69	31	2
Resume	141	130	5
Job search	169	100	11

REVIEW AND RECOMMENDATIONS

FOR THE MIDLAND AREA DISLOCATED WORK FORCE

based on a study done by the

Center for Labor Studies
School of Urban and Public Affairs
Carnegie-Mellon University

on behalf of the

Joint Company-Union Community Training Committee

and the

Midland Center for Career Development

July, 1984

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1. PREFACE

The following report is the result of a five month study of the dislocated work force in the Midland, Pennsylvania area and its attendant problems. The material was prepared by the CMU Center for Labor Studies for the Joint Company-Union Community Training Committee and the Midland Center for Career Development and consists of the following:

- Chapter two provides a broad overview of the problems created by the closing of the Midland Crucible Steel plant in February, 1983, of the efforts by a cooperative union-management team to alleviate those problems, of the work done by the Center and of the recommendations based on our investigation of the problems.

- A survey of 518 former Crucible Steel employees yielded the characteristics of displaced workers and the analysis of their needs found in chapter three.

- Many disparate economic development activities are taking place; our work has been to draw those efforts into one place and make some comments on them. This is found in chapter four.

- An analysis has been made of auto industry training and retraining programs. The lessons learned are contained in chapter five.

- Based on our study, we have developed some conclusions and recommendations for retraining, entrepreneurship programs and job/business development which may be found in chapter six.

- Appendix I contains a copy of the survey instrument, the needs questionnaire, and the General Aptitude Test Battery (GATB) score request form. Appendix II contains tables based on complete data derived from the 518 survey interviews; part 1 consists of tables broken down by sex and part 2 consists of table broken down by age with females removed. Appendix III contains statistical tests which indicate the survey's relevance to the work force in question. Appendix IV contains an extensive inventory of applicable training in the three state area.

It is hoped this material will be useful for the participants in the Midland program and for others who are working to help solve the difficult problems of the unemployed.

Otto A. Davis

W.W. Cooper University Professor of Economics and Public Policy

(Chairman, Policy Committee of CMU Center for Labor Studies)

2. OVERVIEW OF THE PROJECT

2.1. A Profile of Midland

Closing the Crucible Steel plant at Midland, Pa. was an unusually traumatic event.

The plant was at the hub of an isolated labor market with the intersection of three states making it a virtually dependent region. Despite being within commuting distance of many other facilities, the workers looked at Crucible as their source for jobs, and others in the communities related very strongly to the economic ripples from the Crucible works.

The story of the communities involved provides a sharp picture of events in many other areas where jobs have suddenly disappeared.

One thing that stands out in bold relief is the tenacious hope people sustain that somehow jobs will return. In other instances, workers get mixed signals which can lead to confusion. In the case of Midland-Crucible, no such explanation exists.

The Jones and Laughlin Steel Company purchased the plant from Crucible Steel in February, 1983, and has never issued any message other than that it would operate a small portion of it with three to five hundred employees. No other message has been forthcoming, not from the union or the press.

Yet, it is reported over and over that many, and perhaps most of the former Crucible employees are waiting to return. This phenomenon is not unique; it seems to go hand in hand with a culture and tradition in which a plant or industry dominates the area's labor market. If that's where work was for two or three generations, the assumption is not swept away easily.

Even disclaimers are not convincing, either because people can block out bad news or because the reports are simply not believed. Not believing becomes a way of life for people who have previously had reason to doubt authorities and experts.

No single jobs problem is more difficult than this one. Any policy of job placement requires the applicant to be aggressive, dedicated to the search and job ready. What a job seeker considers acceptable in the labor market depends in large measure on the person's perception of the available options.

Efforts to help people get jobs they do not want cannot be successful. In fact, if employers feel that the unemployed will be recalled, they hesitate to hire people who are certain to leave for their old job, usually superior in many respects.

Therefore, in discussing the Midland reemployment strategy the first essential is identifying the realities of the job market. If idle workers are somehow led to hope they will be called back, their incentive to seek new careers is sharply curtailed and perhaps non-existent.

What is needed, therefore, is realism.

The employment rolls of the basic steel industry have been on a steady decline for a good portion of the past generation. That trend did not match the output index of the industry but often defied increased activity. The major explanation for this decline in employment is the continuing upgrading of technology despite the popular myth that the companies made virtually no investment in modernization.

Furthermore, steel management has been involved in a constant effort to rationalize the organization of the work force and the production methodology of the operations. The rapid rate of retirement has aided this process since it is easier to not replace employees who retire than to remove people from jobs.

Current speculation about the future of the industry helps to produce misunderstanding. While there is good reason to be optimistic about the future of the steel industry, health does not mean jobs. In fact, it is entirely possible that the steel industry's recovery and progress will occur because through technology and organizational rationalization, the jobs are reduced so sharply that the resulting cost picture will be a key to greater strength for the companies.

Many steel workers and others today criticize the industry for not doing a better job of management and modernization; those who voice these sentiments seem to hide from themselves the inevitable fact that what they advocate will result in less jobs.

A generation ago when world steel demand was rapidly rising, there was reason to believe, or at least hope, that greater competitiveness could result in more jobs. In this era, the relatively static demand for steel and the drastic nature of job-reduction programs, not confined to this country but world-wide, prevent any reasonable scenario that could result in expanding direct steel employment.

A prosperous steel industry could result in more jobs, but not within steel plants. The rippling effect is a reasonable expectation and, in turn, a rising level of affluence leads to further job creation through rising demands for services.

Where this analysis leads is to job seekers looking toward the fields of job expansion.

The essential obstacle to such aspirations is the popular view that non-manufacturing jobs are inherently low paying. Involved in this belief is the assumption that jobs are paid on the basis of some scale of skill or importance. The evidence refutes this. Some high paid jobs are low skill and many high skill jobs command low pay. Beyond this, the relative position of jobs in terms of pay changes frequently and even drastically as a result of a wide variety of influences.

Also, information about jobs, rates of pay and opportunities for advancement is very inadequate. Making career decisions based on rumor, general impressions and broad averaged data can be unfortunate if the objective is to find the areas of activity where people can advance and can establish satisfactory careers.

A major obstacle to providing better information about jobs is the difficulty of predicting the impact of labor market pressures and union factors on the changes in pay practices in any given industry or firm.

Displaced steel workers should take a hard look at the realities they face.

A major problem for the displaced worker is the lack of adequate information and advice from reliable and competent sources. Many displaced workers never looked for a job. The job they lost was their first job. Others have never operated in a job market where the employer was not out looking for people to hire and where locating a job is a major struggle.

The Midland Center for Career Development is a new departure. It was set up by J & L and the United Steelworkers of America. The joint committee has a one year steady guaranteed income stream from the labor agreement which provides that J & L will contribute 75 cents for each hour worked by the current Midland plant employees through 1984 in order to aid the job search not only for former Crucible employees but people who would have been Crucible employees had the plant remained in operation.

This assured and private arrangement gives the joint committee flexibility and a good deal of autonomy. Neither the company nor the union is in the training or counselling business. Without vested interests and without the inhibitions that come with regulated agencies, this program can go directly to whatever it takes to aid the people in the tri-state area.

The story of the activities to date follows:

Midland and the surrounding communities of Chester, West Virginia and East Liverpool, Ohio, have been engaged in full-scale economic development efforts. Beaver County (in which Midland is located) has commissioned a re-use study of the Midland plant being done by Gibbs and Hill. Another study of the so-called Route 60 corridor from the Greater Pittsburgh Airport to Beaver Falls, Pennsylvania, is being done by Zuckely-Hunter.

In Midland, itself, two economic development committees are working to revitalize the economy through the attraction of new businesses.

In Ohio, the East Liverpool Chamber of Commerce is the active group and has Dr. Terry Buss of Youngstown University conducting a regional study. Recently, a waste technology project was approved which should attract secondary operations to a small industrial park near the town on the basis of available low cost energy.

The efforts in Brooke County, West Virginia, are many and disparate. Notable projects in the area are the conversion of the Selletex plant with a million dollars of EDA money and the purchase of an old plant site by a private developer who is currently looking for possible clients for a privately-sponsored industrial park.

The efforts of Jones and Laughlin Steel Company and the United Steelworkers of America began in February of 1983 when they established the Joint Company-Union Community Training Committee.

The committee was and is basically funded by a J & L contribution of 75 cents per hour worked by J & L employees in the Midland plant. The funds are turned over to the joint committee for their use in training and activities associated with helping the former Crucible employees and other community members finding work.

In September of 1983, the joint committee launched the Midland Center for Career Development, the operating arm of the committee. The Center is located in the local union hall and has been staffed for business.

The Center provides continuous one-week job search workshops. It conducts workshops in communications, math and computer literacy. It provides ongoing support to persons actively seeking work.

The committee worked with the National Alliance of Business and the Human Resource Development Institute of the AFL-CIO to develop programs and a proposal to get a large federal grant to be used for major retraining projects. They commissioned this study by the Carnegie-Mellon University Center for Labor Studies to identify areas of job growth, characterize the affected employees, do an economic development survey of the area and make recommendations for training and small business development.

A survey was designed by the CMU Center for Labor Studies with the assistance of the committee, HRDI and fifteen outreach workers selected by MCCD and USW personnel. The purpose of the survey was to develop a profile of characteristics of these laid off workers. The questions asked fell into the broad categories of personal characteristics (demographics), employment and education history, current status (income sources, medical insurance), and training. A needs questionnaire was administered at the same time as the survey, asking for the respondent's own perception of his and his dependents' needs for various services. The fifteen outreach workers received training in crisis intervention and were given a broad overview of social services available to displaced workers in the areas in which they were to interview. A small directory of local service providers was given to each respondent.

The fifteen interviewers drew names from a Crucible employee listing and started contacting people by phone to ask for cooperation with the survey and set appointments for interviews.

The survey results indicate that this is a fairly well-educated group: 88% have a high school education or better. Over 85% of them are married. Over 78% own their homes rather than rent, with 41.5% of the home owning group having five years or less to go on their mortgages. This means they have a lot of equity in the home and are probably not good candidates for relocation considering the current state of the area real estate market.

Only 22% report having found a new job. Response to questions about the full time/part time and permanent/temporary status of the new job was sketchy. Only 16% of those reporting having found a new job indicate that the job is full time and permanent; 32.8% report that they are working part time, compared with 33.6% who report they are working full time. In other words, only 18 of the 114 who have found a new job report a confidence in the job's future.

When asked about income sources, 33.4% are receiving a pension from Crucible; 0.8% report having a pension from another employer. Only 7.6% were still collecting unemployment compensation as of January 1, 1984. Also, 19.4% are receiving food stamps and 8.9% report that they receive welfare payments. A full 22.5% report they have no benefits whatsoever and have not found a new job.

As for medical coverage, 33.4% are receiving Crucible medical insurance, 11.4% are covered under a spouse's policy, the same percent have taken out their own personal medical insurance, 8.5% report that they receive medical coverage from a new employer, and a full 29.2% report they have no medical coverage at all.

2.2. The Future

The Midland activities can be channeled into a variety of directions:

1. A strong counselling program is needed. While this is an activity which should properly be carried on by the Job Service, its woefully inadequate program requires a *Midland Center* response for the present.

   Such counselling should include interest and aptitude testing so that people better understand their own potentials and options. This activity must be very closely linked with information about the job market so that the employee is not guided toward non-existing jobs.

   Helpful counselling must include thorough evaluation of financial issues with the unemployed. The impact of the reservation wage is very important. There is an amount of pay that is inherently unacceptable because whatever a non-working person has in the way of income helps determine the least for which he or she will work.

   Steel workers are accustomed to very effective career ladders and therefore will readily understand whether or not there are prospects for advancement in a given situation. This knowledge should be obtained and made available.

   Whoever does counselling must understand some of the intricate phases of benefit programs since some provide for continued payments even if the person has earnings and some do not. People should be helped in sifting their way through that problem and others. Rather than develop its own counselling staff, the Center can contract with existing institutions or agencies if adequate ones already exist.

2. Job information is essential. The Center should convene the groups that now gather or receive job information for the purpose of assuring a central bank of information available in a form which can be called up quickly. If an additional effort is needed, the Center should do what is needed to assure comprehensive job data. Included must be an all-out community effort to convince employers, no matter how large or how small, to provide notice of vacancies, current and projected.

3. A thorough inventory of training-related institutions and programs should be gathered and kept up to date. Creating new programs should be avoided if applicants can use some existing program or if the services can be purchased on an appropriate basis. The Center should determine whether it should directly provide specific training itself if that option is either more cost effective or desirable for other reasons.

4. Special emphasis should be placed on offering and encouraging computer literacy training. A public information program should be launched indicating its nature and importance. As of now, there is inadequate awareness of what is involved and of how important such knowledge is likely to be in the general labor market. Employers would naturally prefer a person with computer experience to one who needs in-house training to handle the firm's basic computer needs.

To do this, it might be useful to have local TV programs which universities could help develop.

5. The kind of job readiness programs that the Center has been conducting should be expanded and popularized so that employees can upgrade their abilities and be made more effective in their job-seeking efforts. More should be done to popularize the programs, explaining exactly what is involved and the positive results.

6. A source of employment growth is self-employment, likely to become a greater factor in job development. Much of the gain is dependent on the availability of support mechanisms, noticeably lacking now. The Center should mount a major effort to encourage interested persons to consult with the Center so that advice can be given.

   Because start-up costs and training expense subsidy for persons seeking self-employment careers are not available, the Center should provide funds for these purposes in an appropriate manner. It is possible that a fund for revolving small loans along with a strong advisory program could plow some new ground for job creation, of value not only to the Midland program but for transfer to other areas.

7. An essential player in the job search effort is the person who is seeking a job. For that reason, it is important to keep those people fully informed. The more they know, the better. If they are not kept informed, they will depend on rumors and misinformation.

   To address this crucial problem, an extensive information program should be developed and carried on. It should report on events, information, support the Center's programs and, in general, help to promote an understanding of what is going on and what areas exist or can be explored for job opportunities.

   Consideration should be given to a periodical, justified on the basis of the need to help the job seeker achieve the motivation and orientation necessary to make the Center's efforts effective.

   We feel it would be appropriate to join in an initial effort to set forth to the communities involved a factual background picture so that the subsequent efforts will have a base of support from the community and more importantly, the job seekers themselves.

3. SURVEY

3.1. Purpose

The purpose of the survey was two-fold: to collect information on the needs and characteristics of workers displaced by the closing of the Midland Crucible Steel plant and to provide an outreach effort from the Midland Center into the community. To facilitate this communication, it was decided to use interviewers from that same work force. Fifteen people were chosen to both geographically and demographically represent the varied population.

The interviewers were brought to a day-long training session at Carnegie-Mellon University where they learned about the joint committee, the proposed study and listened to university people and the committee chairmen describe the situation in Midland and put it in perspective as to the Northeast and the country as a whole. The joint training program was described and discussed as well.

Next, we discussed the importance of collecting good information on the needs and characteristics of the dislocated workers and what use this information would be to the activities of the committee. The survey was then distributed and discussed with the group step by step. Directories of social service agencies and other helping institutions pertaining to the three states in question were also distributed. At the end of the day, people were asked to take turns administering the survey to each other.

The group met the following day at the Midland Center where, with the assistance of Tony Sarmiento of the Human Resource Development Institute of the AFL-CIO, the workers went through the survey item by item and made suggestions concerning the wording and sensitivity of some of the questions. To preserve anonymity, the GATB questionnaire and the two page needs questionnaire were moved to separate sheets of paper. The needs questionnaire asked for a name and phone number so that the respondent could be contacted in relation to the help and information requested concerning retraining, starting a small business, help in locating a new job, etc. The GATB questionnaire was primarily a form authorizing the Midland Center to obtain the results of General Aptitude Test Batteries administered by the Pennsylvania State Job Service. These test results will be used in counselling individuals. Copies of the survey instrument, the needs questionnaire and the GATB request form can be found in the appendix.

3.2. Selection Process

The fifteen interviewers were chosen to somewhat proportionally represent the population of the work force as far as state of residence, sex, race, and, to some degree, age. They worked with a directory of names provided by the local union office, and were asked to choose people from their general locality. They were asked to select five people they knew fairly well as a start and then choose 30 people only on the basis of residence and availability (willingness, still living in area, not working at J & L). We decided to omit the approximately 300 people who are currently working at J & L since the committee's major concern rests with those who are still looking for work or who may have found jobs with uncertain prospects for permanence.

3.3. Summarized Findings

SECTION I: PERSONAL CHARACTERISTICS

I.A DEMOGRAPHICS

Table I.A.1: STATE IN WHICH RESPONDENT LIVES

[Recorded by interviewer]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	518	486	32
Ohio	287	55.4%	58.4%	9.4%
Penna	183	35.3%	31.7%	90.6%
W Virginia	48	9.3%	9.9%	0.0%

Chi square (2df): 45.72 [<.0001]

Note: see text for a description of the sample selection process

According to the results of our chi square tests, our sample fairly closely resembles the population from which it was drawn. The greatest percentage of the work force came from Ohio in spite of the fact that the plant was located in Pennsylvania. A very small percentage of the workers came from the West Virginia panhandle.

Table I.A.2: SEX OF RESPONDENT

[Question 3: "Sex: male / female"]

	ALL	MALE	FEMALE
	100.0%	93.8%	6.2%
N	518	486	32

Our sample tends to include a few too many females considering the small number of women in the Crucible work force. One interviewer out of the fifteen was female and most of her respondents were female as well as a few from the other fourteen interviewers' respondents. We don't see this as a tremendous problem, but we redid the tables, extracting the females, and the results can be found in Appendix II.

Table I.A.3: RACE OF RESPONDENT

[Question 4: "Race: white / black / american indian / hispanic / asian"]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	518	486	32
White	478	92.3%	94.2%	62.5%
Black	31	6.0%	3.9%	37.5%
Hispanic	9	1.7%	1.9%	0.0%

Chi square (2df): 60.48 [<.0001]

According to our chi square tests (Appendix III), the racial distribution in our sample fairly represents the total population of Crucible workers.

Table I.A.4: AGE OF RESPONDENT

[Question 1: "Age: ____"]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	518	486	32
Mean		41.4	41.8	35.7
Std Dev		10.7	10.7	10.0
Minimum		23.0	23.0	23.0
25 Pctl		32.0	32.0	28.0
Median		41.0	41.0	31.5
75 Pctl		50.0	50.0	44.0
Maximum		66.0	66.0	57.0
Under 25	7	1.4%	1.2%	3.1%
25 to 29	69	13.3%	11.9%	34.4%
30 to 34	95	18.3%	18.1%	21.9%
35 to 39	73	14.1%	14.6%	6.3%
40 to 44	76	14.7%	14.6%	15.6%
45 to 49	67	12.9%	13.6%	3.1%
50 to 54	52	10.0%	9.9%	12.5%
55 to 59	51	9.8%	10.3%	3.1%
60 and up	28	5.4%	5.8%	0.0%

Chi square (8df): 20.04 [.01]

One age group appears to have too many respondents according to the chi square tests. The 40 to 44 age category is too heavily represented. The reasons for this may be that this age group is the one caught in between--they didn't have enough seniority for retirement, perhaps, or if they did, their fixed expenses (mortgage, loans, children in school, etc.) are so high that they don't feel the freedom to take a much lower paying job and work their way up slowly as do people in their twenties or early thirties.

Table I.A.5: EDUCATION OF RESPONDENT

[Question 23: "How many years of education have you completed?
8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / other ____"

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	516	484	32
8	20	3.9%	4.1%	0.0%
9	10	1.9%	1.9%	3.1%
10	20	3.9%	3.9%	3.1%
11	12	2.3%	2.5%	0.0%
12	360	69.8%	69.8%	68.8%
13	33	6.4%	6.2%	9.4%
14	37	7.2%	6.8%	12.5%
15	14	2.7%	2.7%	3.1%
16	10	1.9%	2.1%	0.0%

Chi square (8df): 4.93 [.77]
Interpretation: no significant differences by sex

We have many more people with 12 years of education in our sample than in the total work force. Again, a guess as to why this happened might be that those with more education found that they had more versatility in the job market and are already employed elsewhere. The workers with fewer than 12 years of education tend to be older workers because of the postwar hiring policy at Crucible which required a high school diploma as a term of employment.

I.B FAMILY COMPOSITION

Table I.B.1: MARITAL STATUS

[Question 19a: "Number of living family members: spouse ____"]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	518	486	32
No spouse	76	14.7	13.0%	40.6%
Spouse	442	85.3	87.0%	59.4%

Chi square (corrected,1df): 16.21 [<.0001]
Interpretation: females are less likely to be married

We have no information as to the marital status of former Crucible workers, but these figures are in line with our expectations about small town/semi-rural communities such as these. People tend to marry, rather than stay single, and families tend to be more stable, at least during times of stable employment.

Table I.B.4: TOTAL NUMBER OF DEPENDENTS (INCLUDING RESPONDENT)

[Computed from all responses to Question 19]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	518	486	32
1	50	9.7%	9.7%	9.4%
2	110	21.2%	21.2%	21.9%
3	99	19.1%	19.1%	18.8%
4	153	29.5%	30.0%	21.9%
5	73	14.1%	14.0%	15.6%
6	18	3.5%	3.3%	6.3%
7	10	1.9%	2.1%	0.0%
8	3	0.6%	0.4%	3.1%
9	2	0.4%	0.2%	3.1%

Chi square (8df): 12.60 [.13]
Interpretation: no significant differences by sex

Note: assumes "0" for parents and other dependents for dropped interviewers and thus may understate total for some respondents

Again, our expectations are met, since four persons tends to be the most frequent family size.

I.C HOUSING

Table I.C.1: TYPE OF HOUSING

[Question 15: "Do you: rent / own your own home or are you buying it (through a mortgage) / live in someone else's home"]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	517	485	32
Rent	87	16.8%	15.7%	34.4%
Own	406	78.5%	80.0%	56.3%
Live w/oth	24	4.6%	4.3%	9.4%

Chi square (2df): 10.04 [.007]
Interpretation: females less likely to own home

These people tend to be homeowners, again no great surprise.

Table I.C.2: TIME TO GO ON MORTGAGE
(Respondents owning or buying home ONLY)

[Question 16a: "How many years do you have left before you own your own home: 1-5 / 6-10 / 11-15 / 16-20 / 21-25 / 26-30 / other"]

		ALL	MALE	FEMALE
		100.0%	95.0%	5.0%
	N	357	339	18
Paid off	66	18.5%	18.3%	22.2%
1-5 yrs	82	23.0%	23.6%	11.1%
6-10 yrs	68	19.0%	19.8%	5.6%
11-15 yrs	62	17.4%	17.1%	22.2%
16-20 yrs	46	12.9%	12.4%	22.2%
21-25 yrs	29	8.1%	8.0%	11.1%
26+ yrs	4	1.1%	0.9%	5.6%

Chi square (6df): 8.19 [.22]
Interpretation: no significant differences by sex

These figures are important, since they show that 41.5% of the sample either owns or is within five mortgage years of owning their own home. This says that these people have a tremendous amount of equity in their homes and would probably not be able to relocate easily without taking a substantial financial loss since the real estate market is currently so depressed.

SECTION II: EMPLOYMENT HISTORY

Table II.A.2: MILITARY SERVICE

[Question 8a: "Are you a veteran?" yes / no]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	516	484	32
Yes	266	51.6%	55.0%	0.0%
No	250	48.4%	45.0%	100.0%

Chi square (corrected,1df): 34.13 [<.0001]
Interpretation: females less likely to have military service

Slightly more than half of the men and none of the women are veterans.

II.B CRUCIBLE EMPLOYMENT

Table II.B.1: LENGTH OF SERVICE AT CRUCIBLE

[Question 6: "How many years did you work at Crucible? (Length of service when you were laid off) ____ years"]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	518	486	32
Mean		16.9	17.4	8.8
Std Dev		10.6	10.6	6.7
Minimum		1.0	1.0	1.0
25 Pctl		8.0	9.0	4.0
Median		14.0	16.0	8.0
75 Pctl		24.0	26.0	13.0
Maximum		45.0	45.0	26.0
Under 6 yrs	71	13.7%	12.1%	37.5%
6-10 yrs	154	29.7%	29.6%	31.3%
11-15 yrs	44	8.5%	7.8%	18.8%
16-20 yrs	81	15.6%	16.5%	3.1%
21-25 yrs	44	8.5%	8.6%	6.3%
26-30 yrs	46	8.9%	9.3%	3.1%
31-35 yrs	47	9.1%	9.7%	0.0%
36+ yrs	31	6.0%	6.4%	0.0%

Chi square (7df): 28.36 [.0002]
Interpretation: females had less seniority

It is interesting to note that 43.4% of the respondents had ten or less years of seniority at the time of layoff. The plant closed in February, 1983; layoffs had been occurring over a period of about two years. Therefore, a large part of the work force (at least as indicated by our sample) was hired during the 70s.

II.C LAYOFF AND POST-CRUCIBLE EMPLOYMENT

Table II.C.1: NUMBER OF MONTHS SINCE CRUCIBLE LAYOFF

[Computed from Question 7: "Last day of work at Crucible:
month ____ day (if known) ____ year ____"]

		ALL	MALE	FEMALE
		100.0%	93.7%	6.3%
	N	509	477	32
Mean		22.3	22.1	24.7
Std Dev		6.3	5.8	10.9
Minimum		5.0	9.0	5.0
25 Pctl		18.0	19.0	17.0
Median		20.0	20.0	20.5
75 Pctl		26.0	25.0	29.0
Maximum		53.0	53.0	45.0
0-12 mo	10	2.0%	1.5%	9.4%
13-18 mo	117	23.0%	22.9%	25.0%
19-24 mo	244	47.9%	49.7%	21.9%
25-30 mo	77	15.1%	14.9%	18.8%
31-36 mo	46	9.0%	9.2%	6.3%
37+ mo	15	2.9%	1.9%	18.8%

Chi square (5df): 43.97 [<.0001]
Interpretation: significant differences by sex

The importance of these figures is that they show that most people have exhausted their unemployment benefits. The average time of layoff as of January 1, 1984 was 22 months. Also, they are important to bear in mind when the number of respondents finding a new job is discussed next.

Table II.C.3: CURRENTLY EMPLOYED

[Question 9a: "Have you found a new job?" yes / no]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	517	485	32
Yes	115	22.2%	20.8%	43.8%
No	402	77.8%	79.2%	56.3%

Chi square (corrected,1df): 7.84 [.005]
Interpretation: females more likely to be currently employed

Only 22.2% of the respondents report having found a new job, remembering that the average length of layoff is 22 months.

Table II.C.4: PERMANENT/TEMPORARY STATUS OF CURRENT JOB
(Respondents reporting a current job ONLY)

[Question 9b: "If yes, specify job title, type of work, and whether full or part time, permanent or temporary"]

		ALL	MALE	FEMALE
		100.0%	87.8%	12.2%
	N	115	101	14
Permanent	25	21.7%	21.8%	21.4%
Temporary	36	31.3%	27.7%	57.1%
Unspecified	54	47.0%	50.5%	21.4%

Chi square (2df): 5.61 [.060]
Interpretation: no significant differences by sex

31.3% of the 115 reporting having found a new job, describe the job as temporary, possibly meaning that the job doesn't meet their qualifications for full employment or that the employer considers the job temporary.

Table II.C.5: FULL-TIME/PART-TIME STATUS OF CURRENT JOB
(Respondents reporting a current job ONLY)

[Question 9b: "If yes, specify job title, type of work, and whether full or part time, permanent or temporary"]

		ALL	MALE	FEMALE
		100.0%	87.8%	12.2%
	N	115	101	14
Full-time	38	33.0%	36.6%	7.1%
Part-time	37	32.2%	33.7%	21.4%
Unspecified	40	34.8%	29.7%	71.4%

Chi square (2df): 9.96 [.007]
Interpretation: significant differences by sex

32.2% of the 115 reporting having found a new job have part-time jobs. These people had been full-time employees of Crucible.

SECTION III: CURRENT STATUS OF WORKERS

III.A SOURCES OF INCOME

Table III.A.1: PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC TYPES OF PENSIONS, UNEMPLOYMENT/RETRAINING BENEFITS, AND TRANSFER PAYMENTS

[Question 10: "Which of the following benefits are you currently receiving: food stamps / welfare / Soldiers & Sailors Relief (VA) / Crucible pension / pension from another employer / none / unemployment¦expire____ / SUB benefits¦expire____ / TRA¦expire____ / Social Security / VA Educational Benefits / TAA / Other (specify)"]

[Question 12: "Do you presently have health insurance coverage" covered by spouse's policy / personal coverage / crucible policy / medicaid / other (specify type) __________ / none"]

		ALL	MALE	FEMALE	
		100.0%	93.8%	6.2%	
	N	516	484	32	
Cruc pens	161	31.2%	32.6%	9.4%	Chi(c,1): 6.53 [.01]
Soc secur	19	3.7%	3.7%	3.1%	Chi(c,1): 0.00 [>.99]
Other pens	4	0.8%	0.2%	9.4%	Chi(c,1): 21.97 [<.0001]
Unemploymt	39	7.6%	7.6%	6.3%	Chi(c,1): 5.83 [.054]
TAA	13	2.5%	2.7%	0.0%	Chi(c,1): 0.13 [.72]
SUB	10	1.9%	2.1%	0.0%	Chi(c,1): 4.07 [.13]
TRA	5	1.0%	1.0%	0.0%	Chi(c,1): 1.45 [.48]
VA eductn	2	0.4%	0.4%	0.0%	Chi(c,1): 0.00 [>.99]
Food stamps	100	19.4%	18.8%	28.1%	Chi(c,1): 1.13 [.29]
Welfare	46	8.9%	8.3%	18.8%	Chi(c,1): 2.88 [.09]
Medicaid	40	7.7%	7.0%	18.8%	Chi(c,1): 4.29 [.04]
Sold & sail	7	1.4%	1.4%	0.0%	Chi(c,1): 0.00 [>.99]
No benefits, no job	116	22.5%			

Interpretation: females are less likely to receive a Crucible pension and more likely to receive Medicaid or an "other" pension or Medicaid.

Some respondents receive multiple benefits; others receive none at all. The final entry is one of concern to planners. One hundred and sixteen people, or 22.5% of the respondents, report having no new job and no benefits. Probably a portion of these people are living on savings accumulated while they worked at relatively high paying jobs for such a rural area and part of the people have continued to support themselves by doing odd jobs.

III.B MEDICAL INSURANCE

Table III.B.1: TYPES OF CURRENT MEDICAL INSURANCE COVERAGE REPORTED

[Question 12: "Do you presently have health insurance coverage"
covered by spouse's policy / personal coverage / crucible policy /
medicaid / other (specify type) __________ / none"]

		ALL	MALE	FEMALE	
		100.0%	93.8%	6.2%	
	N	518	486	32	
Crucible	173	33.4%	35.0%	9.4%	Chi(c,1): 7.74 [.005]
Spouse	59	11.4%	10.7%	21.9%	Chi(c,1): 2.69 [.10]
Personal	59	11.4%	10.3%	28.1%	Chi(c,1): 7.80 [.005]
Employer	45	8.7%	8.4%	12.5%	Chi(c,1): 0.21 [.64]
Medicaid	40	7.7%	7.0%	18.8%	Chi(c,1): 4.29 [.04]
None	156	30.1%	31.3%	12.5%	Chi(c,1): 4.18 [.04]

Interpretation: females are less likely to have no medical insurance at all or to have Crucible insurance but more likely to have personal coverage or spouse's policy coverage

Note: percentages sum to more than 100% because some respondents have more than one type of coverage

Of some real concern here is the 30.1% who report having no medical coverage. Those reporting personal coverage are those who have taken it upon themselves to secure medical coverage independently through some carrier.

III.C FAMILY SUPPORT

Table III.C.1: FORMERLY PRINCIPAL SOURCE OF FAMILY INCOME

[Question 17: "Before being laid off, were you the principal source of income for your household?" yes / no]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	514	482	32
Yes	481	93.6%	95.6%	62.5%
No	33	6.4%	4.2%	37.5%

Chi square (corrected,1df): 49.49 [<.0001]
Interpretation: females less likely to have been principal income before layoff

Table III.C.2: CURRENTLY PRINCIPAL SOURCE OF INCOME

[Question 18: "Are you currently the principal source of income for your household?" yes / no]

		ALL	MALE	FEMALE
		100.0%	93.8%	6.2%
	N	513	481	32
Yes	371	72.3%	73.0%	62.5%
No	142	27.7%	27.0%	37.5%

Chi square (corrected,1df): 1.16 [.28]
Interpretation: no significant differences by sex

A change of over 20% has occurred. Either a spouse has gone back to work to help support the family, or salary that had been a minor contribution to the family income is now the major source of family income.

Table III.C.7: SPOUSE SEEKING EMPLOYMENT
(Respondents reporting a spouse living with or otherwise dependent on the respondent only)

[Question 19d: "Seeking employment: Spouse ____]

		ALL	MALE	FEMALE
		100.0%	95.7%	4.3%
	N	423	405	18
Yes	200	47.3%	46.7%	38.9%
No	223	52.7%	53.3%	61.1%

Chi square (2df): 1.75 [.42]
Interpretation: no significant differences by sex

Almost half of the respondents report that their spouse is seeking employment.

SECTION IV: TRAINING

IV.A SUMMARY

Table IV.A.1: PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC TYPES OF FORMAL TRAINING AND ON-JOB TRAINING

[Question 24: "Beyond high school, what type of education have you received? Specify names of institution; degree, certification or diploma received; major course followed, year work was completed. (This does not include on the job training.) vocational __________ / technical __________ / trade __________ / apprenticeship __________ / college __________ / other __________ / special skills received in the military __________"]

[Counted from Question 26: "List all formalized training you received on the job or in connection with any job"]

		ALL	MALE	FEMALE	
		100.0%	93.8%	6.2%	
	N	518	486	32	
College	81	15.6%	14.2%	37.5%	Chi(2): 12.44 [.002]
Technical	54	10.4%	10.7%	6.2%	Chi(2): 0.69 [.71]
Vocational	86	16.6%	16.9%	16.5%	Chi(2): 0.53 [.77]
Trade	27	5.2%	4.9%	9.4%	Chi(2): 1.42 [.49]
Other	16	3.1%	2.9%	6.2%	Chi(2): 2.13 [.34]
Apprentice	18	3.5%	3.7%	0.0%	Chi(c,1): 0.37 [.54]
On-job	144	27.8%	25.3%	65.6%	Chi(7): 88.63 [<.0001]
Military	166	32.0%	32.0%	0.0%	

Interpretation: females more likely to have college and on-job training, less likely to have other types of formal training

Note: chi square statistics are computed using separate cells on the number of training programs of each type; no female respondents reported military service

This is a well-educated and well-trained work force.

3.4. Population Characteristics

We were able to obtain some information on the complete Crucible work force from October, 1981. From a Labor Pool Report we obtained birth Year, plant seniority, and years of education. From an Incumbency Report, we obtained sex, race and job class.

We characterized the complete work force according to these six parameters. Additionally, the Midland USW office gave us statistics on numbers of worker from each state. Our sample of 518 is, in most areas, statistically representative of the total population by state of residence, age, sex, race, and length of seniority. The population figures and chi square tests done to determine statistical representativeness, are in Appendix III. The most significant differences between the sample and the population are that we interviewed a few too many females (one of the fifteen interviewers was a woman and she was instructed to interview women and some of the other interviewers included women, too.) and too few people over sixty.

Since women comprise only 1.26% of the total population and 6.18% of the sampled individuals were women, if policy were to be made which required exact proportions from the survey results, it would be most accurate to use the cross tabulations done by sex and consider only the figures for males, or use the cross tabulations done by age with females omitted.

The interviewers reported that there was a general unwillingness among older workers to participate in the survey. This probably accounts for the relatively low number of people over sixty years of age in the sample.

The population was altered by the fact that we did not interview anyone who had taken a job at J & L and that there has been some unestimated amount of out-migration in the area.

3.5. Needs

Percentage of respondents reporting need for services.

N = 503 = 100%

	OHIO		PA		W VA	
TOTALS *	280	56%	178	35%	45	9%
Brush up	223	44%	111	22%	17	3%
Retraining	270	54%	145	29%	17	3%
Entreoreneurship	175	35%	104	21%	15	3%
Assistance in finding a job	258	51%	161	32%	26	5%
Relocation assistance	89	18%	76	15%	10	2%
Benefits	103	20%	63	13%	8	2%
Child care	20	4%	17	3%	0	0%
Health	99	20%	58	12%	6	1%
VA	57	11%	63	13%	8	2%
TRA	151	30%	83	17%	4	1%
TAA	135	27%	82	16%	5	1%
Bills	12	2%	8	2%	0	0%
Stress	20	4%	10	2%	0	0%
Legal	38	8%	15	3%	0	0%
Utility	88	17%	45	9%	5	1%
Food	69	14%	31	6%	2	1%
Resume	141	28%	130	26%	5	1%
Job search	169	34%	100	20%	11	2%

* Includes both workers and dependents

4. ECONOMIC DEVELOPMENT UPDATE

February 1, 1984

4.1. WEST VIRGINIA

Brooke County efforts continue with a multitude of actors and minimal cooperation. At this time, there are several economic development agencies operating with discussions of some kind of consortium. However, there has been little progress in this area.

Projects pending in this region include the conversion of the Selletex Plant with one million dollars of EDA money. In addition, a private developer has purchased the Taylor, Smith and Taylor plant in Chester and is currently looking for clients for this privately sponsored industrial park.

One project that is sure to impact on any cooperative efforts is the planned Waste Technologies project in East Liverpool, Ohio. This effort has been strongly opposed by West Virginia Residents and several governmental agencies in the area.

4.2. BEAVER COUNTY

The Gibbs and Hill study, is behind schedule but is expected to be completed by early April. Also the Zuckely/Hunter Corridor Study is scheduled to be completed soon. Bob Zapsic, planning director for the county, feels that these two efforts will be instrumental in determining long range economic planning.

4.3. OHIO

The regional portion of the study commissioned by the East Liverpool Chamber is about three months behind schedule and is proceeding, but without any urgency for a completed product. The Waste Technologies project seems headed for approval with one more regulatory agency needed before the project can get underway. Once the project is approved, a major push will be undertaken to locate secondary industries near the facility with the availability of low cost energy as a major incentive.

In each of the areas there is a definite set of activities that is progressing as the communities try to respond to fundamental changes in their industrial base. Any attempts to pull the parties together must contend with the fact that there are already projects either in the planning or in initial start up phases. What is not needed is another restatement of the problems, but rather some concrete help to aid the communities, to bring off some of the already planned projects. It may be that the most cost efficient manner in which to proceed is to fund an economic development specialist to be shared by the various agencies. This person should not be just another grant writer, but rather someone with a proven track record in making deals, in marketing and in working on a regional basis. Care must be taken, no matter what is done, not to have the project seem as a "Midland only" solution but rather the goals must be understood to encompass the entire area.

ECONOMIC DEVELOPMENT CONTACTS

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Beaver County Vo-Tech
[Business Survey]
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OHIO	Richard Humphreys Director East Liverpool Chamber (216) 385-0845
	Dr. Terry Buss Youngstown State University [Business Survey] (216) 742-3370
	John Hudack Director Catholic Social Services (216) 424-9504
	Carol Beretz Deputy Director Community Action Agency (216) 424-7221
	Helen Bloor Director of Planning Columbiana County (216) 385-0845

WEST VIRGINIA	John Beck JTPA of Ohio Director of Brooke - Hancock Counties Regional Development (304) 797-9666 or (614) 282-3685
	Gene DelGreco Planner Brooke - Hancock Regional Development (304) 797-9666
	George Tokash John D. Rockefeller IV Vo-Tech [Business Survey] (304) 564-3337

5. AN ANALYSIS OF THE FORD MOTORS-UAW AND GENERAL MOTORS CORPORATION-UAW TRAINING PROGRAMS

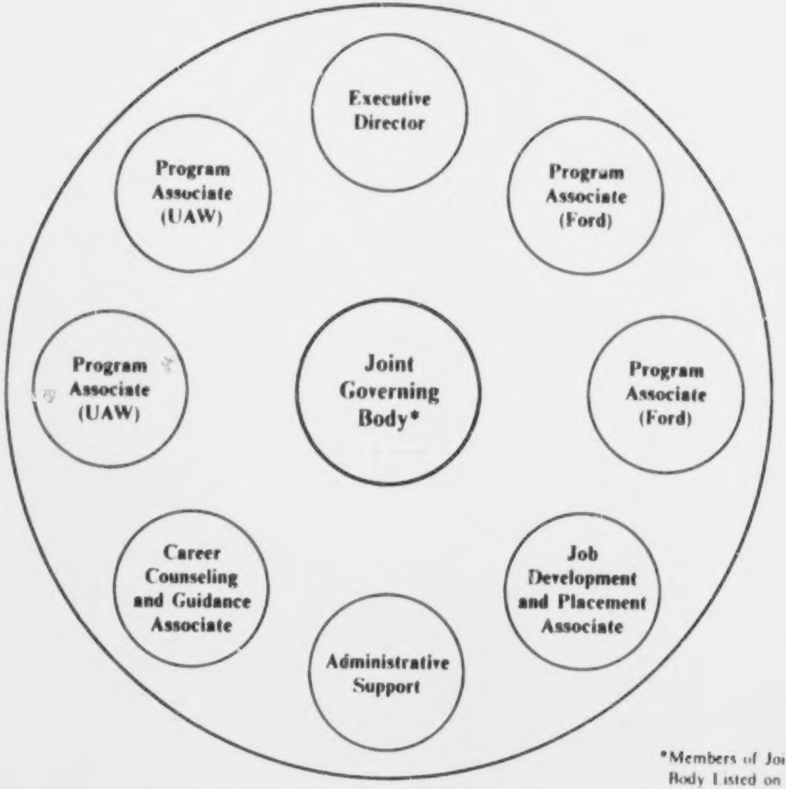
Both the Ford Motor Company-UAW and General Motors-UAW training/retraining programs are ambitious, comprehensive efforts that are widely considered to be on the cutting edge of cooperative industry-union displaced worker programs. Each of these programs offer valuable lessons in the areas of retraining, program development, implementation strategies, and outcome evaluation procedures. In addition, the Ford experience, and to a lesser extent the GM efforts, have been operating for a sufficient time period to enable insights to be drawn in the areas of basic skills development, career awareness programs, and targeted training efforts. These programs also provide models of private funds that have been leveraged with State and Federal funds to create a broad range of services. However, it has been the philosophy of both programs to expend their own funds when quick action was needed and delays were judged to be unacceptable.

In addition to lessons that can be drawn across both of these programs, various programmatic differences exist that reflect different retraining philosophies. For example, the Ford program incorporates an element of providing tuition payments based solely on individual choice. The classes selected do not have to be in a degree program and could be in any field. On the other hand, efforts of the GM/UAW are more in line with retraining for "Definite Growth Areas".

To begin this analysis, the GM/UAW program will be presented first. This will be followed by a description of the Ford/UAW efforts, keying on lessons gained from over a year of operations that are relevant to the Midland situation.

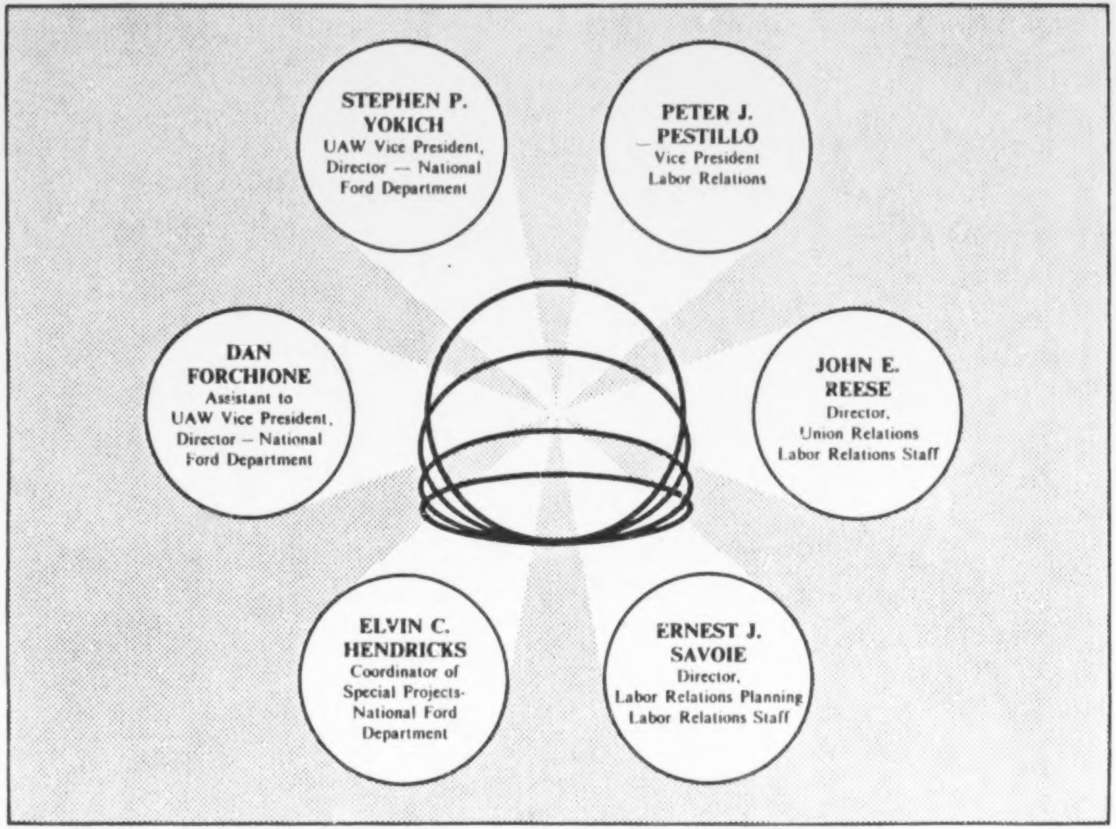
UAW-FORD NATIONAL DEVELOPMENT AND TRAINING CENTER

PEOPLE & FUNCTIONS


Executive Director
Program Associate (UAW)
Program Associate (Ford)
Program Associate (UAW)
Joint Governing Body*
Program Associate (Ford)
Career Counseling and Guidance Associate
Job Development and Placement Associate
Administrative Support

*Members of Joint Governing Body Listed on Reverse Side

JOINT GOVERNING BODY


STEPHEN P. YOKICH
UAW Vice President, Director — National Ford Department
PETER J. PESTILLO
Vice President Labor Relations
DAN FORCHIONE
Assistant to UAW Vice President, Director – National Ford Department
JOHN E. REESE
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NATIONAL DEVELOPMENT AND TRAINING CENTER

5.1. UAW-General Motors-State of California

In response to several plant shutdowns, the UAW and General Motors joined in setting up the Joint Skills Development program. The goals of this program were to provide matching grants to attract State and Federal monies into a displaced workers program and to provide a variety of services.

Early in the planning process, it was decided that the number of direct services provided by the program would be limited to those not readily available elsewhere. Therefore, the Joint Skills program approached the State of California as a direct service provider. The state of California entered into an agreement to match the private funds on a dollar per dollar basis and to provide labor market information, skills assessment, job search workshops, job development, placement, transportation assistance and retraining programs.

The administration of the programs is being handled by the California Department of Education. The initial plan called for the services to be provided to 2,000 displaced workers.

As a first step in providing services, each worker received a professional assessment of skills, work experience, interests, aspirations, and goals. The results of these assessments were used in counselling the individuals and in helping the job centers develop a "marketing plan" for each person. Retraining programs were only offered to those individuals who could improve their marketability as the result of structured retraining efforts.

The establishment of special programs following the actual screening process was accomplished through a bidding process in which potential service providers submitted proposals detailing the kinds of training that they could provide. Each proposal was required to outline the reading and math skills that workers would need in order to enter the program. Applicants who needed remedial work were encouraged to make use of the Basic Skills Development Program.

A more detailed presentation of the GM/UAW model follows. Information presented in this subsection comes from interviews and official materials.

5.1.1. The UAW/GM Model

The "typical" displaced GM worker can expect to be entered into a system with the following elements:

5.1.1.1. REGISTRATION

Each worker is required to register with a Jobs Center. An initial interview is conducted by job counselors to develop a worker profile including the worker's experience, skills, interests, aspirations, and goals. Based on this review a determination is made on the marketable skills the individual possesses. The individual may be counseled to simply take advantage of job search help, to engage in a "quick" fix program, to enter retraining or to receive more counselling to help clarify their goals.

5.1.1.2. RETRAINING ANALYSIS

Any worker requesting retraining receives a detailed retraining assessment. This assessment includes an in-depth counselling interview, tests to determine the approximate grade level of learning abilities and an aptitude test. No training is approved unless it is in a field that is determined to have to have sufficient potential for future employment.

5.1.1.3. SUPPORT SERVICE NETWORK

Concurrent to skills assessment, each worker is assessed to determine if they need any referrals to a variety of social service agencies. The role of the Centers has been designated to operate as Information and Referral Bodies, to act as advocates and to work through existing community resources. A special effort is made to have individuals view the Centers as places where resources can be found without developing dependency relationships.

5.1.1.4. TRANSPORTATION

The California programs make use of the State's Department of Transportation to help individuals in the following ways:

1. Ride sharing arrangements, including car, bus and van pools.
2. Reduced transit tickets.

Part of the problem discovered was that after a displaced worker had been on layoff for a period of time, transportation to retraining presented real hardships for them.

After the individual has been tested they may either take Job Search Assistance or may seek retraining.

5.1.1.5. JOB SEARCH AND PLACEMENT

If a worker has or can easily, within a short period of time, obtain the necessary skills, they are placed in a job assistance program. This service is also available for those who have completed the retraining program.

Each center has job development staff either employed by the Center or individuals from the Union, GM or retired executives, who aggressively contact employers to solicit job orders and to "market" the skills of an individual worker.

Job Search Workshops/Skills Transference

Through these workshops, individuals are taught how to find local job openings, how to successfully solicit job interviews, and how to successfully perform in the interview process. The focus of the skills transference parts of the workshops is on teaching workers how to analyze their past employment so that they can spot the skills they have gained. Part of this program teaches each participant how to identify those employers who are most likely to have jobs which can utilize their skills.

5.1.1.6. RETRAINING

The staff of each Center develops an individualized training plan for each worker requesting retraining. This is done in part to ensure that the individual remains eligible for benefit programs such as the California Unemployment Insurance Retraining Program. Each of the retraining plans take into account the worker's employment history, skills, interests, and goals. The retraining plans are matched against market conditions and are used to develop specialized training courses and to negotiate for openings in existing training programs.

5.1.1.7. CLASSROOM-BASED RETRAINING

The GM program in California has negotiated with local community colleges, regional occupational program centers, and adult education programs for appropriate classes for GM workers, and for slots in currently funded classes. On the other hand, programs have been established using skilled practitioners to provide training. One such program was set up in antique firearms repair. There has been a market willingness in this program to let those best skilled to do the training do it as long as their qualifications could be verified.

5.1.1.8. EMPLOYER-BASED TRAINING

Staff from the various training centers work with a variety of employers who provide on the job training and subsequently hire the workers once the training period has been completed.

This has been a highly successful program with a placement rate of almost 100 percent. The problems with this approach include the limited number of displaced workers that can be helped, the high cost, and the danger of making the workers "too specialized" to exist in the general labor market. An example was cited of a small group of workers who received training at a particular factory which subsequently went out of business leaving the workers trained on equipment which was not common within the industry.

5.1.1.9. UNEMPLOYMENT BENEFITS

In the State of California, the retraining programs are aided by the fact that any worker enrolled in an approved retraining program under an individualized retraining plan is eligible for up to 26 weeks of additional employment insurance benefits.

To gain a perspective of the scope and activity levels of the GM/UAW California experience, the following table was developed. It is take from The Displaced Worker Problem: Implications for Training and Education Institutions by Arthur Shy, Director of Education Programs, UAW. It summarizes activity in the UAW/GM project through May 1983:

5.1.2. DISPLACED WORKER REEMPLOYMENT PROGRAM

Activity	Services Provided
Registration	8,341
Referred to Training	2,906
Enrolled in Training	2,271
Referred to Supportive Services	2,277
Financial Counselling	251
Employment Counselling Interviews	3,550
Promotional Employer Contact	17,300
Job Development Contacts	2,887
Job Search Workshops	236
Participants in Job Search	1,882
Number of Individuals Entering New Employment	1,456

5.1.3. "KEY POINTS" OF THE PROGRAM

During interviews used to develop this report, participants were asked to provide insights on areas that they felt were going well and on problems that other programs should avoid. These comments have been combined into the following recommendations:

1. Initial testing and extensive counselling are necessary to prepare any individual who is considering retraining. Of special importance is a process of "goal" clarification and a current understanding of the job market potential.

2. Relocation must also be explored as a realistic option which the worker must prepare for. The GM experience indicates that those individuals who are most likely to move do so quickly after the layoff. Those individuals who wait until benefits run out often lack the resources to make a move practical.

3. It has been the experience of these programs that specialists work better than using a generalist approach in which a person may not be well versed enough to provide the necessary advice. The programs have been careful to use certified individuals as test score interpreters and as counselors to avoid any legal problems that might stem from workers being given unqualified advice.

4. A great deal of the impact of the program comes from a planning perspective devoted to an extensive on-going job market analysis. This element was judged by all those interviewed to be of such critical importance that a full time staff was assembled to work on the project. The analysis uses both official statistics and information that this group was able to develop on their own. Most of the contacts made are on a face-to-face basis with employment planning people and, in many cases, with the heads of small and medium-size companies. The programs have had to overcome the resistance of many business people who considered initial efforts to be meddling. However, the quality of the information has been higher than that which official data or previous mailed surveys provided. Labor market information is then used to develop and modify job placement and training efforts. The strength of this work comes from the capacity to react quickly to changing demand, especially in the development of new program areas. In the case of the GM effort, a program in satellite and microwave technology was developed. This program has been able to place all of its graduates. This came about because interviewers worked with small and medium-scale companies who were developing around major defense and telecommunication contractors.

It has been the experience of the GM/UAW that it is simply not enough to do a one time "This is what we retrain for..." analysis. Shifting market patterns, economic upturns, new technologies, competition from other programs, changing worker supplies all add up to the need to change programs as conditions dictate.

5. In addition to the testing and market analyses efforts, other key elements include programs developed to provide basic skills training to individuals before they are placed in any level of retraining. The experience indicates that remediation must take place prior to retraining. Several examples were found indicating that remediation efforts held concurrently with training caused a high drop-out rate. One advanced electronics program had to be cancelled because of a high failure rate traced to a definite literacy problem. There was a strong feeling that the initial "rush to retrain" must not blur the fact that a strong new foundation may have to be provided to many workers if the training is to be of any value. There is also a tendency to look at the displaced work force in terms of people who have a high school education and who functioned as responsible workers and to somehow equate that to mean that basic skills competency can be taken for granted. This, obviously, is not always the case.

6. Direct service provision must be keyed to enabling the individual to receive training while still collecting necessary benefits. In the case of basic skill remediation, the programs were begun, in many cases, before the actual shutdowns. The programs are designed to maximize the available service network. Without this network, few of the retraining efforts could have succeeded.

7. The establishment of the training programs took 2-4 months depending on the complexity of the programs involved. The GM/California experience indicates that an in-depth analysis of each training facility was essential before any funds were committed. Part of this set up time should include an on-site inspection. During several of these inspections, problems were discovered with facilities whose equipment did not meet industry standards.

8. Monitoring and evaluation instruments for retraining programs were developed and put into place before each program began. As a result, both participants and vendors knew what was required of them. Having the procedures already implemented made it possible for programs that were not working well to be terminated. In addition, data gathered from initial program evaluations provided subsequent modifications in program design. For example, a program was temporarily suspended because of problems with certain equipment that the school promised, only to fail to deliver as the students needed it.

Applicable lessons from the GM experience include the importance of counselling services, the importance of benefits as a determinant of retraining success, the need for complete planning, and the "creaming" effect, which is an inevitable part of various retraining programs.

5.1.4. Counselling

The success of the various GM efforts can in part be attributed to the intense job counselling program available to all the displaced workers. Professional full-time counselors work with each individual to develop an appropriate program. These counselors have the ability to administer a battery of tests, interest inventories, and can even request the services of "specialist" counselors in problem cases. This service is important because the majority of individuals simply do not know how to proceed or plan a new career once their unemployment period has exceeded beyond what has been their typical experience. Out of this desperation comes a rush to take any kind of training because doing something is better than no activity at all. This leads to unusually high drop out rates as individuals find out that they are being trained in fields that do not "fit" them. Counselling diminishes this problem area.

It is interesting to note that the "high-tech" areas are more likely to be requested simply because individuals perceive that these are growth areas. This has led to requests for training for computer operators even though the future demand picture is not clear.

In addition, the counselling function also feeds back to the labor market component. Michael J. Riley of the California Bureau of Vocational Education commented about the counselling function: "It is critical that workers be counseled about realistic job prospects and openings that will exist when they have finished their training." This is vital because of the potential disaster which occurs when the individual makes an investment in time and lost revenue only to find that there is no employment potential in the field they have retrained in.

5.1.5. REMAINING BENEFIT LEVELS AND THEIR IMPACT ON RETRAINING

Several of the GM/UAW programs had the benefit of either beginning during shutdown phases or soon after they had begun. In other cases, workers received the benefit of extended unemployment. What the experience indicates is that it is as difficult to enroll individuals in anything but short term (6 months or less) retraining programs once their benefits have been exhausted.

In the few cases where advance notice was not possible, the retraining efforts had their best success with intense programs that had a maximum length of 6 months. Any program that went beyond this period experienced drop out rates that escalated with the length of training. This situation does not present the optimal climate for retraining. The utilization of short term programs carries with it a set of tradeoffs.

Many programs, such as computer programming, require a number of credit hours that simply cannot be condensed into a shortened time frame. In addition, careers in many fields such as bio-technology require at least a 2 year associate degree as an entry-level condition. The lack of benefits, then, creates several problems. These include:

1. A decision must be made as to the training programs that people can attend and still hope to survive economically.
2. Even though the benefits problem is well documented, no easy solution is available. The GM/UAW Training Council considered some sort of living expense stipends while individuals were being trained, but rejected this as both too complex and too costly. Working spouses, and linkages to remaining social service benefits may provide some help in these cases to get the worker through retraining.

5.1.6. PROGRAM PLANNING

The planning process of the GM/UAW programs has focused on a limited set of goals and the efforts have been channeled so that the achievement of these goals has a high probability of success. In many cases, programs benefited only a select group. While not a perfect situation, problems of this kind have not kept this group from moving forward, setting up programs and getting on with their overall agenda. In addition, the following related observations are relevant:

1. Experiences indicate that setting up programs, negotiating class slots, record keeping and developing new classes quickly becomes a complex task. These programs cannot be efficiently handled as an "add on" to other programmatic areas. Tasks of job search, counselling, and retraining, while being related, should be handled by different specialized individuals to assure that during each part of the process the worker feels that the highest quality services are being provided. In addition, there are considerations of helping displaced workers, many of whom have been outside the educational system for years, to make smooth transitions back to classroom settings. These tasks are being administered separately from pure job placement functions.

2. Another aspect of the retraining program that requires attention is the necessity of closely monitoring all directly funded and contracted programs. As programs complete their first cycle, it is necessary to weed out the ineffective ones, and to expand those who are meeting workers' needs. In addition, it is necessary to develop bid specifications for newly planned efforts based on previous monitoring reports.

5.1.7. OTHER IDEAS

1. **The "Upside Down" Approach.** This set of techniques has proven to be effective with displaced workers. The theory behind these efforts is that the displaced worker must be kept active and should always be able to see the immediate results of their efforts. As a result, this curriculum is designed so that individuals start with manipulative skills and learn the theory as they go along.

2. **Intensiveness.** This involves some programs of 1000 hours of training in less than one year, accomplished through scheduling classes 8 hours a day, 6 days a week. These programs have been geared toward computer-oriented careers.

3. **Computer Literacy.** This is a program being considered for widespread use with displaced workers. It would involve six weeks of computer skills with an emphasis on using the computer as a word processing system and in learning to use the various kinds of computer software.

4. **Customized Retraining.** The Centers pay half of a workers salary for 10-12 weeks while they undergo on the job training.

5. **The "Creaming Effect".** An unescapable part of the GM/UAW experience which will confront any Midland Training program is the problem of those people who are already the best educated, mobile and motivated will be, for the most part, the most likely to take advantage of retraining opportunities. The advice of those people working on this problem is that

it can not be avoided in the short run. This does not imply that retraining efforts should be suspended.

6. **Special Needs.** When talking about retraining displaced workers, it pays to continually keep in mind that programs must address the needs of a client group that have, for the most part, been outside the educational system for years. Instructors, texts, programs, and schools need to be examined in light of the special needs of this group.

It must be realized that given budgetary and time considerations, goals might best be articulated in terms of progress made instead of pure numerical measures, as so many placed, retrained, etc. There are those ideal candidates for retraining, who, in most cases, probably could have found other employment without retraining, had they chosen to do so. It is those other workers-- the ones with basic skills problems, with motivational difficulties, that provide the true group from which standards should be developed.

5.2. THE FORD PROGRAM

The Ford/UAW Program consists of three major components:

- National Vocational Assistance Program
- Targeted Vocational Retraining Projects
- Career Counselling and Guidance Program

Taken together, these three programs comprise the Employee Development and Training Program. All of these programs share a common governing structure and eligibility requirements.

5.2.1. Governance

Each of these programs is centrally administered by the UAW/Ford National Development and Training Center. The Center was incorporated on June 21, 1982 as a separate legal entity. It is directed and guided by a joint governing body consisting of an equal number of company and UAW representatives.

Day to day operations of the Center are managed by an executive director with a small staff of professional and administrative support personnel, including four program associates, a Career Counselling and Guidance Associate and a Retraining and Reemployment Services Associate. (See Chart 1).

The Center concentrates on planning, design, and coordination efforts. All program evaluation is also handled by the Center. Provision of direct services is not part of the Center's operations. However, the Center acts as a service broker and approves all educational programs.

5.2.2. Eligibility

Training, retraining and development services are available to both active and laid off workers. Specifically, workers qualify if:

- They have recall rights under the current collective bargaining agreement.
- They have at least one year of company seniority, as of the last day worked for the company.
- They have been on indefinite layoff for at least three months.
- There is no immediate prospect for recall.

5.2.3. Financing

All of the programs are funded by a 5 cents per hour work fund. The formula resulted in $10 million dollars being generated annually at 1982 levels.

5.2.4. The Specific Programs

5.2.4.1. National Vocational Retraining Assistance Plan:

1. Provides for tuition of up to $1000 per year, based on seniority for up to four years. See the following table.

YEARS OF COMPANY SENIORITY	ELIGIBLE YEARS OF RETRAINING ASSISTANCE	TOTAL AMOUNT
1-5	ONE	$1,000
5-8	TWO	$2,000
8-10	THREE	$3,000
10 or more	FOUR	$4.000

2. The plan covers:

   a. All courses required for high school completion or equivalency certificates.

   b. University, college, business, trade, vocational, and adult education courses.

   c. Any courses approved by the Center.

3. The National Center evaluates applications and directly pays the schools.

4. All training is self-selected, with no requirements that it be related to specific jobs.

5. From August 1982 to September 1983, 3417 course enrollments have been approved.

5.2.4.2. Targeted Vocational Retraining

This is a specialized retraining effort that includes intensive (6-7 hours per day) full time retraining. Each project is established only after an extensive market analysis has demonstrated that these are definite job prospects available. Programs last from 1 week to 2 years, depending on areas of training. Following are examples of TVR programs:

Computer Numerical Control	10 weeks
Programming Logic Controls	1 week
Small Engine Repair	22 weeks
Electronics	22 weeks
Machine Tool Technology	16 weeks
Microwave Technology	40 weeks
Auto Service Technology	35 weeks
Service Truck Drivers	4 weeks
Heavy Equipment Operators	6 weeks
Computer Repair and Maintenance	33 weeks
Electrical Engineering Technology	52 weeks
Robotics Technology	52 weeks
Licensed Practical Nursing	52 weeks

Telephone Technicians	24 weeks
Video Production Technology	14 weeks

5.2.4.3. Career Counselling and Guidance

This program is designed to equip laid off workers with the necessary tools to develop and achieve an individual career plan. The program is structured into four basic components:

1. self-awareness
2. career awareness
3. career decision making
4. career planning

The following activities take place under the program:

1. Each interested individual is registered for professional counselling aimed at identifying their experiences, skills, interests, and goals. At this point, a joint determination is made as to whether the individual has readily marketable skills, would have the necessary skills with a small amount of retraining, or needs extensive retraining.

2. At the time of this initial assessment, the worker is linked to the available network of social services.

3. Those workers with marketable skills are provided with job search assistance, including: how to conduct a job search, local job openings, resume preparation, interviewing skills.

4. For those workers in need of some type of retraining, individualized assessments are conducted and an individualized retraining plan is developed.

5. In addition to the standard package offered by CCG, the following services have been offered at a variety of locations:

    a. Self-directed job hunting

    b. "Job Clubs"

    c. Job skills workshops

    d. "Career Days"

    e. Basic skills training including math, reading, and communications skills.

f. Preparation for the GED.

This program of Tuition Assistance, intense vocational training, and career guidance has been in operation for a sufficient period that some evidence about the retraining is available.

5.2.5. THE FORD EXPERIENCE

Types of Retraining Programs Chosen:

- The majority (53.9%) chose two year vocational education degree programs, almost all of which involved community colleges.
- 9% chose to pursue a college degree.
- 18% chose non-program courses.

Types of Curriculum:

- Well over half (57%) chose a technologically related curricula with a strong emphasis on robotics and electronics.
- Almost a third (32%) selected data processing.
- 11% chose allied health fields or other courses.

Of those choosing college programs, the majority (64%) chose business or engineering courses.

Credit Hours Selected: College

Almost half (47%) started out with a full-time load of 12 or more course hours.

Credit Hours Selected: Vocational Education

49% enrolled for a full time load of courses (12 or more credit hours), 29% enrolled for at least 7, but less than 12 hours, and 22% started with 6 or 7 credit hours.

Tuition and Fees

- The plan does not cover expenses including books and supplies, transportation and parking, meals and personal items
- The average cost of compulsory fees was close to $400
- The plan covered 95% of tuition and compulsory fees.

There is a strong belief on the part of the National Center Staff that the individuals realized that the retraining is likely to be a painful economic process--in the short term. Those taking part in the program have indicated little interest in "quick" fix type of training and have instead gone after real career oriented programs. It should be noted that this holds true only when training was started immediately after the shutdown, or, in some cases, well before any layoffs began.

Tuition and Compulsory Fees (Part II)

- Over two-thirds (69%) reported tuition was $1000 or less
- 31% reported tuition over $1000
- Few employees received educational financial aid from other sources.

Years of Seniority versus Use of Benefits

Almost half of those using the services had 10 years of seniority or less. Only 15% of those who use the services had 15 years or more seniority.

Program Training Areas

These broad areas have been identified as "growth" sectors for Targeted Retraining:

- computer systems operators
- statistical process controls
- electronics
- building maintenance
- word processing
- medical technology
- advanced auto technologies

The following table reflects the UAW/Ford program through June 1983:

Vocational Assistance	2100
Targeted Vocational Training:	
(a) locations	41
(b) individuals	330

Vocational Plans and Interest Surveys	
(a) locations	16
(b) individuals	6300
Career Counselling	
(a) locations	9
(b) individuals	982
Job Search Skills Training	
(1) Laid-off workers	1000

5.2.6. CONCLUSIONS

The following represent some areas in which the experience of the UAW Company programs can provide guidance to the Midland project.

1. Retraining is not a panacea nor is it likely to have an impact beyond a select group of workers.

2. Arthur S. Shy, Director of Education Programs for the UAW has written: "In both the GM and Ford cases, gains in employment do not appear to result from retraining, but from the program's counselling and job-search advice. Retraining alone does not have a significantly greater impact on unemployment rates than job search assistance." This feeling has also been demonstrated in the research on the economic impact of the Downriver Program.

3. There is little doubt that a certain group of workers will benefit from the retraining programs. However, almost all the evidence indicates that those benefiting are in most cases individuals who already possessed a high degree of competency. This has been the case with the Targeted Program at Ford. The group of workers presently unemployed from Crucible will also have a subgroup that can easily benefit from retraining. But there is a sizable portion for which retraining will present difficult problems.

4. If the individual is not currently being retrained, they will probably be limited in the direction of short term (6 months or less) programs. Benefits have run out, in many cases, living stipends are not currently available and the necessary array of social services including transportation, child care and subsistence programs are not designed to handle individuals with two-plus years on unemployment who are just about to begin retraining. Sheldon Freedman, Research Director of the UAW, wrote that "Restrictions on stipends and allowances limit the

effectiveness of all our retraining efforts. The supportive services can be of critical importance and are often a pre-condition for success in any kind of training. Many dislocated workers, particularly those who have been unemployed for some length of time, cannot pay for transportation to the training sites, do not have money for lunches, telephone calls for job searches, or transportation to interviews..."

5. Neither the GM/UAW nor the GM/Ford programs operate as pure retraining efforts. Responding to plant closings is only a part of a much larger training effort. Many of the people who receive benefits through this program will ultimately be hired at other company facilities. At this point it is not clear how many people are placed in supplier or subsidiary industries. In addition, it is not possible to clearly delineate those aspects which are training for employment within versus those operating for employment outside the company. These factors do not preclude looking at these experiences for insights, but rather serve as limits on directly modeling these programs to conform to the Midland situation.

6. Success in all these programs has been affected by the larger labor market. In parts of California that remained strong throughout this recession, placement has been high. In Michigan, the picture is not nearly so optimistic. This signifies that realistic goals given the current labor market must be developed. This also means that the claims of success of these programs must be tempered with an analysis of where the placement occurred.

7. The issue of short term versus longer term training revolves around the individual's circumstances, family conditions, availability of programs, and potential for successful placement once training is completed. Both types of training are applicable in the Midland context.

8. Short term training has the advantages of removing the person from the job market and job search for only a limited period of time. As stated before, this can be crucial for an individual trying to get by on limited resources. Another advantage of short term training is, if it is successful and if the person is placed, it is a great ego building experience with almost immediate impact. While no systematic study has been accomplished, the positive impact associated with the move from short term training to placement can be important for the individual. One such short term program is the telephone installation program sponsored by the Allegheny Council JTPA; it is short term, but has a high placement rate.

9. Longer term training also has a place, but more care is needed, especially in the market analysis. A state of California program for aircraft technicians has continued to achieve high placements even in the face of deregulation because it was set up to feed into the needs of small airlines and air freight sources that the deregulation spawned.

10. Training should he evaluated on the basis of programmatic content, market analysis, and the limited benefits environment of the client group. Those requesting longer term training should be counseled as to the economics involved including the possibility of resorting to welfare or other programs, no matter how distasteful this may be.

11. Proposals to link training to a specific employer should receive close examination, especially in the area of cost and degree of mutual benefits. There is a real danger involved in firm specific or equipment specific education. All in all, the goals of the business are met, but the individual's long term welfare may be sacrificed. Specific employer linkages are the current rage but they contradict study after study, such as the one conducted by Frank Pratzner of the National Center for Research in Vocational Education. His research indicates that broad generic needs that all industries have in common, not the specialized needs of one firm, should be the training goal. This implies that any firm-specific program must be limited and must be funded only after the maximum numbers have been served through individualized short and long term programs.

Several local PIC's are convinced that this is the way that training should be provided; in many cases, their analysis is short ranged at best, based on a few successful cases, but lacking sufficient data to form the basis of public policy.

With any move into the "customized" program area, the best course would be to function as a testing and counselling body feeding into established programs. Actually setting up this type of program would be so costly that only a limited number of people would be served.

5.2.6.1. JOB COUNSELLING AND JOB SEARCH

Job counselling and job search activities form part of the cornerstone of all of the displaced worker programs surveyed. Full time extensive job counselling geared toward realistic employment goals greatly increases the opportunities for individual success. Literature suggests that employees go through phases in a job loss situation similar to those experienced by those who experience the loss of a loved one. A key block in retraining programs is to get the individual away from thinking of the world in terms of their old job and to develop a working framework geared toward current job realities.

One aspect of this research that has proven itself in a variety of locations is the long term impact of successful job search assistance that may aid as many people as the retraining. In addition, preliminary data suggests that the economic gains of job search only participants and those seeking retraining may be equal.

5.2.6.2. Education versus Retraining

One of the most dramatic impacts that could be accomplished has to do with the areas of basic skills education and computer literacy. The actual process of employment of a blue collar work force makes the massive use of specific skills-oriented training suspect. The potential impact on the currently displaced Crucible work force will be most dramatic if they are seen by prospective employers as "attractive". This would include helping those who need a high school diploma to get one, making sure that those who have a diploma can read, write, and compute at levels promised by their credentials. Functional illiterates, or, in the future, computer illiterates, will not make safe, flexible, productive, or easily trained employees. It may well be that basic educational shortcomings may keep some workers from being employed rather than their lack of specific job skills. This leads to the following recommendations:

1. That each individual worker who cannot actually function at the skill level of a high school graduate be given the opportunity to complete the necessary courses so that they can do so.
2. Every effort should be made to use existing programs to accomplish this goal. However, it is of such importance that the committee should proceed in any case.
3. Some type of "computer literacy" be made available on a large scale to the displaced work force. This aspect had been considered by several programs and is being studied by the UAW/Ford Development Center. Given the inexorable growth and proliferation of the computer as a generic word, information and control tool, the need for computer skills can no longer be doubted. The Midland Center has the opportunity to take a bold step in the area of bringing education related to computers to a large number of displaced workers. The possibility exists that a large computer vendor could be involved and that funds might be available to do this as a pilot project. In any case, the continuum of so-called "basic skills" should be expanded to include computer skills.
4. This approach will enable the displaced work force to be readily adaptable to subsequent jobs. In addition, it is more efficient to use funds for "basic" areas while letting the firms provide job specific training.

Besides the actual retraining efforts, an aspect that the Ford/UAW and GM/UAW programs have failed to take into account is the potential benefit of extending job counselling and job search to all family members. There is a need to expand the focus of displaced workers' economic bases to include the family as the basic unit. Evidence indicates that maintenance of any standard of living for the displaced worker results in both spouses and, at times, even children becoming wage earners. What has been overlooked until now is that spouses may show a great benefit from being exposed to job search techniques and career counselling. Retraining may be limited to the worker because of budget constraints, but this too should be expanded when funds become available. However, job search and counselling remain a cost efficient way to increase the financial base of displaced families. These activities may only exist if they are combined with counselling and education geared toward helping people who for years conceived of themselves as the "sole" source of income.

This may also require new financial counselling, not only geared toward traditional areas such as budgeting, but also to areas of starting basically from "square one" for many workers. This is another area where the Midland project could set up a model program which may attract other funding sources.

5.2.6.3. Small Business Development

As far as any kind of training or program in the area of small businesses, neither the UAW/GM programs nor the Ford/UAW have set up any formal efforts. Any training that is done is completed through the SBA. This is another area that the committee can break new ground in. A successful program would change the perceptions of "training" displaced workers in some narrow category to that of providing the necessary educational tools to enable them to function in fields of their own choosing.

This review of training programs has suggested that a number of different alternatives exist for dealing with worker reemployment. Some workers may need only the help of a good employer "job watching" system. Many need reliable information about where they can use their existing skills in a new job setting or where they might be able to get jobs for which employers may be willing to provide training.

Others need good occupational counselling to help them identify strengths and come to realistic goals and to understand job search techniques. Some displaced workers will be in need of remedial education. Training must include the capacity of both short and long term programs. Finally, it must be realized that retraining can only do so much. It cannot change the market condition of an area nor can it guarantee a job. In the final analysis, the best results come when retraining programs are combined with aggressive business development programs and small business development efforts.

6. EMPLOYMENT GROWTH AREAS

Or Lessons on How Not to
Create a Better Class of Unemployed

The task of being able to "guarantee" job placement in certain occupations remains an impossible undertaking given the types and reliability of currently available labor market data. Anecdotal information, business survey data and officially prepared documents have left many of the practitioners surveyed still looking for answers to the question "what do we train people for?" The following are excerpts from interviews conducted with JTPA and other officials in the three state area.

6.1. Summary of Current Retraining Wisdom

6.1.1. Beaver County, JTPA

This group has no data on specific occupations, but rather they are relying on programs which emphasize the *on the job training* approach. They are looking at programs which give "practical" experience. Finally, they are generally looking into developments in the service sectors.

6.1.2. Ohio Service Delivery Area Including Belmont, Harrison, Jefferson, Monroe, Nobel, Washington Counties.

They are looking at certificate type programs and a variety of short term programs. They see a limited role for long term efforts because participants cannot survive economically. The following are programs they are looking at as growth areas:

1. Basic electronics
2. Business machine repair
3. Metal working trades

A fourth area that is interesting is the Business Secretarial Upgrading Program.

This effort seeks to provide secretaries with a foundation in accounting and bookkeeping. For example, an individual may seek to work at a small business or may choose to develop the skills of a medical secretary. In any case, they have been trained in an additional set of skills which they bring to a variety of prospective employers.

6.1.3. State Bureau of Employment Security - Pittsburgh

A labor market analyst was contacted. The reason for this contact was to check on a supply/demand model of individuals in training vs the estimated demand for those occupations. Although this document exists, it is generated purely for internal use. Fields of a general nature suggested include:

- Health care
- Sales
- Food service
- Clerical

There was a general feeling that the computer field is being glutted. In addition, the feeling is that most displaced workers will find employment without extensive retraining. Specific EMPLOYMENT FIELDS includad:

1. Auto repair ....Reasonable numbers
2. Electronics....Excellent
3. Office equipment repair....Good
4. Biomedical technology....Growth expected
5. Quality control/Safety technology.... Growth expected

6.1.4. Mahoning Columbiana SDA

No Idea

They are going to do a business survey to determine the needs. Currently, they are using some OJT with steel workers. The feeling is that the labor market is in a period of transition making meaningful projections impossible.

6.1.5. (West Virginia SDA)

Crystal Ball Stuff

The situation is so bad that they may use Enhanced Employability-vs-Entered Employment criteria on training efforts. An expectation exists that West Virginia will be one of the last states to recover from the recession and that any training programs must take that fact into account.

6.1.6. Youngstown SDA

There is a definite pattern in job growth in the areas of retail sales and service jobs clustering around part time employment at minimum wage scales. However, there are other growth areas including:

1. LPN's... high demand
2. Computer repair
3. Electronics... good
4. Auto mechanics
5. Numerical controls
6. Draftsman/CAD/CAM

They are looking at ways of strengthening the industries they have left. However, as far as the labor market is concerned, there are basic questions as to what the shift from "basic" industries will mean. The operational philosophy here is that "computers are changing everything." Although this basic orientation is present the next step has not been planned.

6.1.7. Akron

Few Shortage Occupations

They have not conducted a labor survey but rather are working on a task force at the PIC. Currently they are working on the 1985 planning process focusing on vendor proposals to document demand. The demand occupations include:

- Computer repair

- Business office repair

6.1.8. Canton SDA

They are in the process of conducting a labor market survey and are not placing any validity on any level of current projections. This program is operating three courses that are of interest:

A. Supervisory Skills--This consists of blue collar workers with good work records who receive an evaluation and are subsequently trained in a variety of management skills. The focus is on turning out "entry level" managers. This program has experienced a high placement rate.

B. Clerical Upgrading--This course updates traditional clerical skills by adding math, accounting, word processing, text editing. The program operates for 6 weeks followed by 40 hours of subsidized OJT.

C. Home Based Business Training--A variety of skills are taught, each pertaining to enabling the individual to operate a small business primarily out of their home.

6.1.9. Allegheny County SDA

Not Including City of Pittsburgh

This unit has had problems with proprietary schools that promised placement and have not delivered. For example, 10 people graduating from the CAD program have not been placed. In computer repair, 50 people are waiting with no positive job outcomes. In a similar manner, a stationary engineer program has not placed a single individual.

Growth areas:

- Basic clerical
- Telephone installation
- Security alarm installation

- Surgical technician
- Nurses' aides
- LPNs
- Retail sales
- Fast food workers

It has been their experience that short term training, i.e., a maximum of 6 months, offers the best chance of positive placements. Some of the longer duration programs resulted in individuals missing placements which went to those people graduating from "Quick Fix" programs.

6.2. Possible Growth Areas That Should Be Researched in a More In-Depth Manner

6.2.1. Automotive Repair

Although this is considered a "traditional" job area, prospects for employment warrant examination due to large scale introduction of computerized diagnostic procedures, emission control systems and new safety equipment. A study completed by the Guidance Information Center of the Allegheny Intermediate Unit suggests that the field will be increasing through 1985. A strong component of any program should be *on the job training* due to the fact that studies indicate that such experience is important in the initial selection process.

This is an area that could take advantage of the skill base of individuals who already work on their own cars. Any program should be geared toward a small business development component where one or several workers could join together to open a garage or repair shop.

6.2.1.1. How to Verify Demand

Survey dealers, service stations, independent garages that may use the new technologies. There would be little hope of contacting the large group of people who work on cars as part of the "underground" economy. However, this is not the market that the training would be geared toward.

6.2.2. Electronic Equipment Servicing

This area should be explored due to the widespread growth of both the industrial and home base use of electrical products. Industrial digital equipment repair, microwave ovens, and VCR's are all new areas that will require service technicians. To document the need, small shops, large service companies, retail outlets, electronics manufactures, distributors, and field service companies would be contacted.

6.2.3. Office Equipment Repair

During the last decade there has been a substantial growth in the use of high speed sophisticated office equipment including electronic typewriters, high volume copiers, dictating equipment, calculators, and wordprocessing equipment.

This is another area that could tie into the small business development component with individual repair shops or repair cooperatives being set up. In addition, there would be the possibility of expanding to include fast food repair including the new cash registers, fryers, convection appliances, and commercial microwaves.

As with the other repair/service areas, contacts would be made including sales servicing departments, retail outlets, independent repair shops, office rental firms, large banks and other financial institutions.

6.2.4. Telecommunications

The deregulation of the entire telecommunications industry and the breakup of AT&T make telephone repair, installation, and interconnect telephone services great growth areas. A program could include repair of home computer tie-ins, such as modems, banking machine repair and biomedical and interactive device repair.

In each of these areas several facts must be considered.

1. Many pieces of equipment such as copiers and computers come with service contracts which provide for a technician. However, this does not mean that some of these people couldn't be placed in these types of jobs. In a sense it doesn't matter if the person is employed by a independent entity or as a manufacturer's service person as long as the demand is there.

2. These jobs may have high growth rates but still only employ a relatively small number of individuals.

3. There exists the supply/demand problem with training institutions turning out people to compete with individuals who are already qualified to do these jobs.

It would be possible to explore these areas, but only with a sufficient period of time to develop face to face contact and to work with individual business groups to develop a true picture of the demand.

6.3. Summary of Current Recommendations for Retraining

Based on material we have gathered from the Bureau of Labor Statistics and on information we have gathered from the JTPA and PIC organizations in the greater Midland area, we set forth the following areas in which it may be feasible to retrain workers:

- Inventory control
- Quality control
- Safety Technology
- Maintenance and repair
  --automobiles
  --appliances
  --office equipment

  - --factory equipment
  - --telephones
  - --home computer tie-ins
  - --banking machines
  - --biomedical and interactive devices
  - --numerical controls

- Telephone installation
  - --especially interconnect

- Security alarm systems
  - --installer
  - --technician

- Health services
  - --practical nurses
  - --nursing aides
  - --orderlies
  - --surgical technicians

- Building maintenance
  - --cleaning services
  - --repair

- CAD-CAM draftsman

- Computer literacy

- Entrepreneurial training

- Home maintenance
  - --inside
  - --outside

- Home building

- Skilled repair
  - --shoe repair
  - --purse repair
  - --jewelry repair

6.4. Entrepreneurship Programs

Because of the currently difficult economic climate in the tri-state area, some of the hope of business revitalization and economic development lies in the creation of new, small businesses in the area. Workers who have retirement income, and those who have an amount of savings large enough to provide a cushion of living expenses to maintain their households for a period of time, are good candidates for entrepreneurship programs. These people can start their own businesses with the assistance of experienced and trained professionals. Some of these businesses may be one or two individuals only, but some may employ a greater number of unemployed, such as a building and home maintenance and repair, or a home and office telephone installation and repair service.

Given that 294 out of 503 workers filling out the needs questionnaire part of the survey expressed a need for aid and counselling to start their own businesses, we recommend that the Committee develop a fund to be administered by an independent grant committee and hire a counselor to give individualized assistance on an ongoing basis.

6.4.1. Fund

A revolving fund should be obtained from sources such as private foundations and the Economic Development Administration.

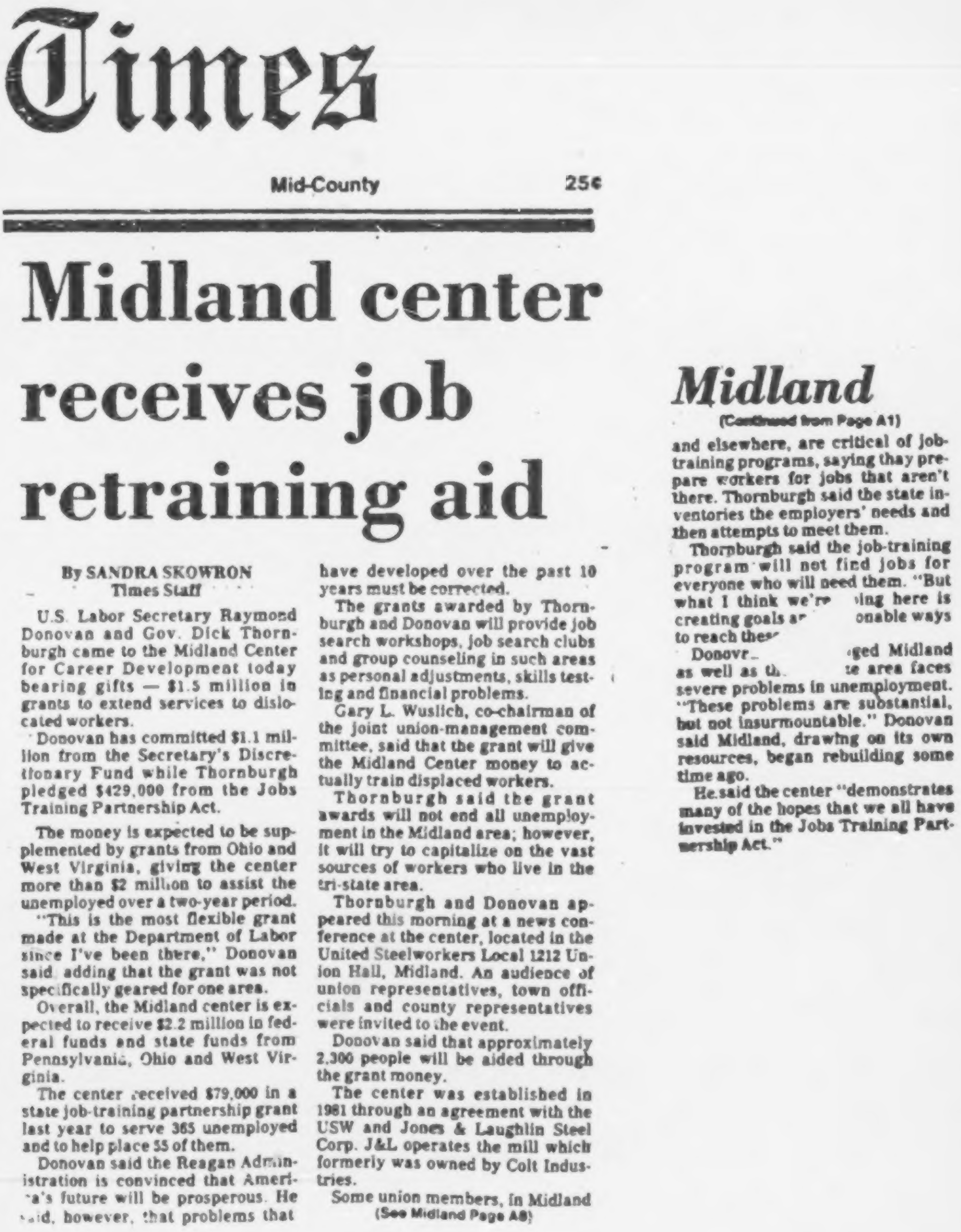
Small loans could be made to eligible individuals. This is not to be considered a major source of capital, but will be enough to provide some initial advertising, legal assistance for purposes of incorporation, rental of tools or equipment, printing of cards or stationery, development of a business plan or just getting the person to the point where they can go to another source for capital for larger ventures. No salaries should be paid out of this money.

The amount of the loan should be paid back to the fund if the venture becomes profitable, making it a revolving fund.

6.4.2. Grant Committee

An independent grant committee should be established, to consist of a clergyman, a banker from a saving and loan association, and one additional member who is either a businessman, a president of a small company, an attorney, a school principal, or someone of similar caliber. J & L and the USW should not be associated with the dispersing of these funds. Additionally, no politicians should serve on this committee.

APPENDIX I
SURVEY INSTRUMENT



Times

Mid-County 25¢

Midland center receives job retraining aid

By SANDRA SKOWRON
Times Staff

U.S. Labor Secretary Raymond Donovan and Gov. Dick Thornburgh came to the Midland Center for Career Development today bearing gifts — $1.5 million in grants to extend services to dislocated workers.

Donovan has committed $1.1 million from the Secretary's Discretionary Fund while Thornburgh pledged $429,000 from the Jobs Training Partnership Act.

The money is expected to be supplemented by grants from Ohio and West Virginia, giving the center more than $2 million to assist the unemployed over a two-year period.

"This is the most flexible grant made at the Department of Labor since I've been there," Donovan said, adding that the grant was not specifically geared for one area.

Overall, the Midland center is expected to receive $2.2 million in federal funds and state funds from Pennsylvania, Ohio and West Virginia.

The center received $79,000 in a state job-training partnership grant last year to serve 365 unemployed and to help place 55 of them.

Donovan said the Reagan Administration is convinced that America's future will be prosperous. He said, however, that problems that have developed over the past 10 years must be corrected.

The grants awarded by Thornburgh and Donovan will provide job search workshops, job search clubs and group counseling in such areas as personal adjustments, skills testing and financial problems.

Gary L. Wuslich, co-chairman of the joint union-management committee, said that the grant will give the Midland Center money to actually train displaced workers.

Thornburgh said the grant awards will not end all unemployment in the Midland area; however, it will try to capitalize on the vast sources of workers who live in the tri-state area.

Thornburgh and Donovan appeared this morning at a news conference at the center, located in the United Steelworkers Local 1212 Union Hall, Midland. An audience of union representatives, town officials and county representatives were invited to the event.

Donovan said that approximately 2,300 people will be aided through the grant money.

The center was established in 1981 through an agreement with the USW and Jones & Laughlin Steel Corp. J&L operates the mill which formerly was owned by Colt Industries.

Some union members, in Midland

(See Midland Page A8)

Midland

(Continued from Page A1)

and elsewhere, are critical of job-training programs, saying thay prepare workers for jobs that aren't there. Thornburgh said the state inventories the employers' needs and then attempts to meet them.

Thorpburgh said the job-training program will not find jobs for everyone who will need them. "But what I think we're ing here is creating goals a onable ways to reach thes

Donov ged Midland as well as th te area faces severe problems in unemployment. "These problems are substantial, but not insurmountable." Donovan said Midland, drawing on its own resources, began rebuilding some time ago.

He said the center "demonstrates many of the hopes that we all have invested in the Jobs Training Partnership Act."

Pittsburgh Post Gazette 4-13-84

Training center gets $1.5 million

By J. Kenneth Evans
Post-Gazette Staff Writer

U.S. Secretary of Labor Raymond J. Donovan and Gov. Thornburgh gave the Midland Career Development Center $1.5 million yesterday.

Donovan contributed $1.1 million and Thornburgh added $429,000 from Job Training Partnership Act funds to help the center's retraining and job search programs for unemployed people.

Donovan said Midland was chosen for the grant rather than a Mon Valley location because its center is operating and because of the work local groups have done in Midland to help the unemployed.

The center takes up the basement of the United Steelworkers Union Hall in Midland. It serves unemployed workers in Pennsylvania, West Virginia and Ohio, and Donovan said he expects the other two states will contribute to it.

The center was created by a contract between USW Local 1212 in Midland and Jones & Laughlin Steel Corp., which bought the Crucible Stainless Steel & Alloy Division Plant in February 1983. The plant closed Oct. 15, 1982.

The plant had employed about 4,000 steel workers, but only about 500 are working now.

So far, the center has served 400 unemployed workers. It hopes to reach as many as 2,300 with yesterday's funding, Donovan said.

About 55 center graduates have found jobs with airlines, insurance companies and in service fields, said Gary Wuslich of J&L, co-chairman of the center.

Harry Coughanour / Post-Gazette

Gov. Thornburgh and U.S. Labor Secretary Raymond J. Donovan announce a federal grant of $1.5 million for the Midland Center for Career Development in Beaver County.

Donovan said the Job Training Partnership Act grant will not solve the unemployment problem in the area or the country.

"This problem is substantial, but not insurmountable," Donovan said.

Thornburgh agreed: "We're not going to find a job overnight for everyone unemployed in the state. ... That's not reasonable.

"We hope the people who have been critical of us will be patient. Long-term jobs are what we're looking for."

Carnegie-Mellon University has conducted a study for the center to determine what types of jobs will be available in communities near Midland.

The study found a need for people in health services; maintenance and repair of home computers, banking machines, appliances, office and factory equipment; building maintenance; and training for self-employment.

Wuslich said most of the center's money is spent on retraining.

He said the center will become a broker to educational institutions in the area, where the unemployed will be taught new skills.

About 36 unemployed people are taking courses now at Pennsylvania State University's Beaver Campus to learn how to operate a computer, he said. That won't teach them how to be programmers, but they will learn how to operate computers, he said.

CSR, Incorporated
1400 Eye Street, N.W., Suite 600
Washington, D.C. 20005
(202) 842-7600

Mr. Stan Ledzinski, Program Director
Midland Center for Career Development
617 Midland Avenue
Midland, Pa 15059

Dear Mr. Ledzinski:

On behalf of Ms. Mary Browne and CSR, Incorporated, thank you for your participation in our recent effort to develop case studies of JTPA Title III projects serving dislocated workers from the steel and copper industries. Without your cooperation, our task would have been impossible. We now have one last favor to ask.

We have enclosed a copy of the case study developed from Ms. Browne's visit to your project. Please review the study and call me at (202) 842-7600 as soon as possible if there are any inaccuracies in our description of your project. We are concerned that we present an objective, accurate account of your project.

Thank you again for your many kindnesses to our field staff.

Sincerely,

A. Lee Bruno

A. Lee Bruno
Senior Associate

Enclosure

ALB:lb

CASE STUDY IV

MIDLAND CENTER FOR CAREER DEVELOPMENT
MIDLAND PENNSYLVANIA

INTRODUCTION

Midland is a small community on the banks of the Ohio River at the convergence of three states—Pennsylvania, Ohio and West Virginia. The town always has been "a mill town" dependent on the massive Crucible Steel Mill stretching for a mile along the River. The town itself follows the contours of the mill and still is dominated physically by the complex of decaying structures. The town and the mill is surrounded by a rural area.

Crucible Steel operated the Midland mill for generations and employed over 4,000 workers at the facility in 1981. At that time, the blast furnace was shut down which resulted in a lay-off of 500 workers. Layoffs of mill employees continued through October, 1982 when the mill was shut down completely. In early 1983, LTV/J&L, a Dallas based conglomerate, purchased the facility and opened a small stainless plant that employed 300 hourly workers.

In September 1983, using funds set aside by the new mill owners, the Midland Center for Career Development was established to assist the families affected by the layoffs. Since then each of the three states has supported the project in a joint effort to provide a wide range of services. A budget of $2,401,000 now funds services for a planned group of 3,000 steel workers and family members. The project is funded until December, 1986.

The project described in the case study that follows has several unusual features. First, the participants live in three different states. Second, the project strives to create new jobs through entrepreneurial efforts. Third, family members of the laid off steelworkers are served along with the steelworkers. Fourth, the company that reopened the mill is a major contributor to the project. As the case study unfolds, it describes not only the development and implementation of a dislocated worker project but also the rebuilding of a community.

COMMUNITY CONTEXT

A considerable ~~intereval~~ interval of time has elapsed between the date when the Crucible Mill was closed and the present. This section of the study reflects upon the status of laid-off mill workers during this 2-1/2 year period and the economic and social changes that create the context for this project.

Midland is a town of approximately 7,000 persons located about 50 miles from Pittsburgh, Pennsylvania to the east and Youngstown, Ohio to the west. Its population is comprised of three major ethnic groups—Italian, Serbian and black. Most of the town's workforce was employed by the mill in 1981. Since the mill's closing in 1982, the town's population has declined as the younger and more mobile of its workers have sought employment elsewhere.

Historically, employment at the Crucible Mill experienced ups and downs throughout its history. The mill always had come back, however, and remained the primary source of employment in Midland for generations. Most of the workers laid off by Crucible's shut-down of the mill in 1982 were convinced that the mill would reopen. At the outset, then, there was little interest in retraining or seeking new work. They were eligible for unemployment assistance and Trade Readjustment Assistance (TRA) and they collected those benefits, confidently awaiting recall to their jobs at the mill.

While the Crucible shut-down dominates the economy of the Midland area, other lay-offs in the area also have affected chances for reemployment of ex-Crucible employees. The ripple effect of a reduction in plant workforce from 4,000 employees to 300 employees on a town of 7,000 is pervasive and traumatic. Nearly all of the businesses in the area that supported Crucible's operations followed with layoffs of their own. These included transportation firms, retail establishments providing services to plant employees and businesses that were affiliated directly with Crucible production processes.

At present, the unemployment rate in Beaver County officially is considered to be 12.9 percent; persons familiar with the community and the history of the layoffs, however, estimate that the rate actually may be as high as 40 percent. This difference in unemployment rates is accounted for by the large number of discouraged workers. Approximately half of the laid off steelworkers still are unemployed. Joining them in the unemployment statistics are their spouses and older children who now also seek employment in order to augment family resources.

Apart from the remaining 300 jobs at the mill, most local jobs are in small manufacturing and machine tool and die firms, a small pottery industry and a large nuclear power plant.

Union, community and Center officials are concerned about this lack of employment opportunities in the area and are encouraging economic development efforts to improve the situation. Efforts have been and continue to be made to attract industry to the area, though with little success thus far. The basic reasons for this limited success are thought to be a reluctance on the part of employers to settle in an area with such a heavy union orientation, and too great an emphasis on attracting employers who would provide large numbers of jobs, 500 or more.

A second strategy for increasing the number of jobs in the community appears to be more productive. This strategy involves the community in creating new businesses of its own design. The Midland Center is an integral part of that strategy.

'state & Federal'

First, LTV/J&L Steel provides funds for an economic development specialist at the Center. This person is responsible for coordinating economic development activities that previously have been the responsibility of staff members with other program duties. Second, one of the Center staff is a member of the local Economic Development Authority.~~and the Midland Burough Council.~~ This ensures that local government economic development efforts are coordinated with the Center's own economic development and training activities. ~~This linkage has resulted in the award of an exclusive contract to the Center to provide 350 employees for a new business opening in Midland.~~

Third, the Midland Center has applied its entrepreneurial talents to the creation of two new businesses. One is a cooperative food store scheduled to open July 1, 1985 that will employ 40 persons. The other is an eight acre hydroponic vegetable farm currently in the planning stage. That operation eventually will employ 300 people.

Beaver County and the ~~Burough~~ Borough of Midland are enthusiastically involved in the Center project. State and local officials from all three affected states sit on the Advisory Council. The Advisory Council provides technical assistance to the Center and ensures that it has access to appropriate resources and is linked to related government programs.

PROJECT ORIGIN

The Midland Center for Career Development had a brief start-up in 1981 when the Crucible blast furnace was shut down and 500 workers were laid off. Local 1212 of the United Steelworkers of America (USWA) negotiated with Crucible, and approached both Ohio and Pennsylvania state capitals to obtain money for job search workshops. At that point, the Center's current director and one instructor were hired. The job search workshops continued for about six months and then ended as funds were depleted.

While more layoffs were imminent, the Union was not yet aware of the real severity of the problems at the mill. As a result, it devoted its energies to reemployment of laid-off workers and continued employment of the existing workforce. When the Crucible Mill finally was closed in October 1982, Union officials recognized that the situation called for entirely different remedies. When the new Mill owner, LTV/J&L, began negotiating a contract with the Union for 300 hourly workers, the Union argued that the Company had an obligation not only to those workers, but also to the almost 4,000 who would not be hired and to the community. This approach resulted in an agreement which provided that LTV donate $1.00 per laborhour worked under the union contract for two years, FY 1983 and FY 1984 to a fund, 25 percent of which would go toward the establishment of a foodbank and 75 percent to the operation of the Midland Center. The last of these contributions was made by the company in December, 1984. Union officials believed that, by taking the initiative in finding funds to start this project, they would be in a better position to secure state and federal funds for its continuation.

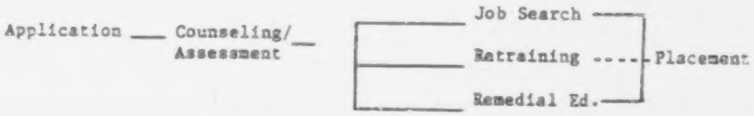
The Midland Center thus started to operate in September of 1983 with funds donated by LTV. Subsequently, with assistance from the National Alliance of Business (NAB) and the Human Resources Development Institute of the AFL/CIO, Union and Midland Center officials developed proposals for additional funding for submission to state and federal agencies.

PROJECT DESIGN AND SERVICE DELIVERY FEATURES

The Midland Center offers its participants three general service tracks--Job Search only, Retraining and General Education. The Job Search service track entails a sequence of services that includes counseling and assessment, job search workshops, and placement. The Retraining service track calls for counseling and assessment, classroom skill training, job search workshops and placement. The General Education service track follows counseling and assessment with remedial education or study for a Graduate General Equivalency Diploma (GED), job search workshops and placement.

Exhibit 1 is a participant flow chart that shows how participants progress through these service tracks. All participants receive counseling and assessment, job search training and placement assistance. All also are eligible for limited supportive services and relocation assistance. While these sequences of services are the general rule, the project is unstructured and flexible enough to allow for other possibilities. For instance, some participants have moved from remedial education to skill training.

Exhibit 1



In the sections that follow, the components that comprise each of these service tracks are described along with other major elements of the program design.

Components

Intake and Assessment. Intake is a particularly important aspect of the Center project since participant residence and work experience often determine what services are available and the specific grant to which the participants' services will be charged. One Center employee is now responsible for intake. Participant eligibility varies in accordance with state residence. In addition to meeting the eligibility criteria set out in JTPA, Pennsylvania residents who are employed are eligible if they earn less than $4.50 per hour. Ohio residents, on the other hand, may earn $5.50 per hour and still be eligible. West Virginia residents and persons not meeting the JTPA general eligibility guidelines of family members are served by the private funds.

Assessment entails the use of a "locator" test at the time of intake. This "locator" is a prescriptive educational test for reading and math capability that places applicants in one of three categories--grades 4 to 8, grades 8 to 12, or grades 12 and above. While math and reading "locators" are given to all participants, an algebra "locator" is given on a more selective basis to applicants with high math scores. Once these "locator" tests are scored, the participant is counseled about program options in keeping with test results. For those scoring below grades 8 to 12 in reading, remediation is strongly recommended.

Most former Crucible employees took the General Aptitude Test Battery (GATB) as part of the union-management agreement at time the plant was closed. Scores from that test are available to the Center and are used as part of the assessment process. Two of the Center's employees are qualified to interpret the GATB.

Remedial Education. Remedial Education has been available as part of the Center program for one year. At first, remedial or "brush up" classes were offered ~~one evening~~ 3 days each week. By May 1985 remedial classes will be offered in the daytime five days a week in addition to one evening class. This activity currently is staffed at the equivalent of one-half of a full time person. In May the staffing will increase to the equivalent of two full time persons.

The current remedial education program incorporates three instructional approaches. The first is the Audio-Visual Tutorial System (AVTS). The AVTS is a commercially-purchased, programmed, self-paced learning package with components in math, reading and algebra. The AVTS consists of the "locator" tests that were mentioned previously, a workbook, four study carrels equipped with slide projector and cassette tape system and a library of learning materials. Each "locator" test question is linked to a specific tape so that participants can key in on problem areas diagnosed by the "locator." Participants work in the AVTS lab as their own time permits in an open-entry mode. They can be expected to participate in the activity for periods of three weeks to one year. The Midland Center has used AVTS for three months.

The second instructional approach is the use of formalized remedial classroom sessions. Here, participants are grouped by areas of common need as determined by the "locator" which identifies classroom training which is required to supplement the student's AVTS activities. The remedial classroom instructor's experience shared with us is that the AVTS programmed learning activities alone are not always sufficient. For that reason, additional classroom instruction has been developed around certain specific skill areas, e.g., electronics, related math and reading, which are in demand.

Instruction which focuses on preparing participants to meet GED requirements is the third instructional approach used by the Midland Center. The Center's formal GED focused classroom training program encompasses six hours of instruction each week for 15 weeks. Of 12 students in the last class, 11 have passed the GED. There are 14 students in the current GED class. The AVTS is used as one part of the GED instructional program.

It is not uncommon for these three instructional approaches to be used in various sequences and combinations to achieve an individual's specific educational objectives. Forty-four people currently are using the AVTB lab and, as of March 28, 1985, 124 individuals had been served by the Center's remedial education component.

Future plans for this component include the development of additional classroom training tailored to demand occupations of interest to participants in preparation for subsequent entry into long-term skill training. Some consideration is being given to the use of long-term retraining participants as tutors for these classes.

Job Search and Resource Center. The Center has offered Job Search classes since September 1983 and, until recently, these classes were the primary service available to participants.. As of mid-February 1984, 630 former Crucible employees, their spouses and other community residents had completed the job search component.

The Job Search class sequence encompasses one full week. Each sequence includes an average of 12-13 participants. The curriculum covered during the week-long sequence includes:

- Preparation for interviews;

Self-assessment
Skills-assessment

- Resume and cover letter development;
- Telephone techniques;
- Application completion; and
- Use of the Resource Center.

Job Search instructional methods include lecture, audiovisuals, role playing, and the use of group interaction for such areas as individual skills assessment. Originally, instructors taught the week-long job search sequences "back-to-back." They now teach a session every other week and use the intermediate week to assist participants refine their resumes and look for jobs.

The Resource Center, whose use is covered in the job search sequence, is a large area centrally located in the Center's facility. Apart from plenty of table space for participants' use, the Resource Center also contains a phone bank with different instruments for local, regional and nationwide long distance calls; weekly classified/business sections of about 20 newspapers from high demand communities along with labor demand materials; industrial directories; telephone directory yellow pages; and bulletins on job openings and training opportunities in those areas.

Retraining. Retraining has been a service track available at the Midland Center since ~~December~~ September 1984 when funds for this purpose first became available. The individual who has primary responsibility for career and retraining counseling has been with the Center since that time. Participants interested in retraining go through assessment with the employment and training counselor. Based on the individual's interests and abilities, the counselor contacts schools and prepares contracts for retraining. ~~All~~ Most retraining is provided through performance contracts, with job placement being the performance indicator. The standard Pennsylvania JTPA training contract is used for this purpose.

Retraining is undertaken on both an individual and group basis. Group training has been arranged in computer related courses, electronics and environmental services. At the same time, individual referrals have been made to existing classes in computers, electronics, medical assistant, refrigeration/boating, and robotics. Schools in the area who provide this training include Penn State, Beaver County Community College, Kent State, Ohio Valley Business School, Triangle Tech, Area Vocational Technical School, Info Age Computer School and Davey Environmental Services.

The Center's employment and training counselor has tested and counseled approximately 100 persons since December 1984. The counselor's work load has been increasing steadily so that now 25-30 persons are served each week.

Transportation is cited as a common problem which hinders participation in retraining. The counselor tries to encourage car pooling to alleviate this problem. A transportation allowance of $5/day also is available on an as needed basis.

Job Development. An individual with specific responsibility for job development has been with the Center project since February 1985. Once the participant's resume is prepared (generally after completing the job search sequence), information organized around occupation and special skills for that participant is entered into the Center's computer system. This system is designed to match employer inquiries and other job information with specific participant's qualifications.

To obtain information on jobs, the job developer contacts employers and personnel directors and used microfiche provided by the New Brighton Employment Service office. In discussions with employers, the job developer emphasizes that the Center provides free screening services to assist them to identify appropriate employees. There have been no negative comments from employers concerning duplications of job development efforts by various agencies.

Relocation. Relocation is a planned Center activity although no participants yet have received financial assistance for relocating. Twenty-two Center participants have relocated without financial assistance, and six currently are working on relocating. Financial assistance for those latter six persons is awaiting a final Center-State agreement on costs and other guidelines.

Most of the unemployed Crucible steelworkers are not interested in relocating. The reasons most cited for not wanting to relocate include:

- Spouse not wanting to move;
- Concerns over difficulty in selling home;

- Belief that the Mill will recall them; and
- The attachment they have to the community.

Those participants who have relocated represent a wide age range and most are married. They are characterized, however, as having few ties to the area in terms of family or length of residence.

Supportive Services. Limited supportive services are available to participants in the Midland Center program. Transportation allowances mentioned earlier are considered as needs-based payments by the Center to subsidize participant travel to job training. Other than these allowances, all supportive services are arranged through referrals to local community resources. The services most generally sought by the participants are childcare and energy assistance counseling.

Integration of Components

The procedure by which participants are tracked through the various project activities now is undergoing substantial change as more services are available. Previously, little tracking was required. The Director now is working on a computer program that will track participants' progress and allow staff access to that information. This computerized tracking system will be the means by which the various Center components will be integrated for the participant's benefit.

Utilization of Funds

As mentioned previously, the project receives funding from various sources, most of which has been made available just recently. The following table lists the sources of funds along with the amounts and project periods to which they apply.

Source	Term	Committed Budget	March 1985
Private	1983-84	$ 300,000 (approx.)	$300,000
Pennsylvania Title III formula funds	6/84-5/86	429,000	119,000
Ohio Title III formula funds	1/85-12/86	572,000	100,000
Title III discretionary funds	Draw-down 3/85 - New term date to be requested	1,100,000	410,000
West Virginia Title III formula funds	Pending	99,000	0
Total		$2,500,000	

All state funds are used solely for training. Administration and services costs are provided by private funds. Of the Federal funds now available, 15 percent will be used for administration and 15 percent for services. The remaining 70 percent is to be allotted to training.

The Project Director and MIS staff salaries have been divided equally between private funds and state JTPA grants since their work also relates to training. Other staff are charged to state grants.

Persons who were Crucible employees have the costs of their participation charged against the state grant corresponding to their residence. Non-Crucible and West Virginia residents' costs of participation are paid for by private funds.

The average cost per participant until now has been quite low since most have received only job search assistance. Job search cost has been computed at $25 per participant. The use of remedial education activities increases the cost per participant an additional $97.

Capital expenditures to date have been limited; the major expenditures have been:

• 3 IBM PCs	- $12,000	(Private Funds)
• AVTS Remedial	- $50,000	(Currently on Loan — to be paid for from Title III discretionary grant funds)
• Remodeling	- $ 3,000	(Private Funds)

The Center's furniture is excess Crucible equipment that was donated to the Center.

In addition to funds that support the actual training activities at Midland Center, there is a separate fund to support economic development and public relations activities. Contributors to this separate fund include LTV, the Campaign for Human Development which is an agency of the Catholic Archdiocese, Duquesne Light Company, and Beaver County. These organizations provide partial funds to finance the Center's job creation ventures, and ~~an~~ economic development specialist. ~~and a public relations specialist.~~

Links with Employers

The project maintains a close relationship with both the local steelworkers union and the LTV stainless plant through the ongoing involvement of the Joint Labor-Management Committee in its activities. The Joint Labor Management Committee is composed of 14 union and LTV representatives. It is the governing body for the Midland Center and actively plans and oversees all Center activities and projects. It was through the Joint Committee that the Midland Center was conceived and developed to its present status as a vital community asset.

In addition to its involvement in the Joint Committee, LTV contributed $300,000 in start-up funds for the Center's reemployment activities and currently funds the Center's economic development position. The company/union also is assisting with the construction of a community medical center.

The union is a pervasive influence in this particular project. Midland Center is located in the Union Hall. The Center's Project Director and the Union Joint Committee co-chair meet informally about twice a week. The USWA also was instrumental in obtaining both LTV support for the project and funds from other public and private sources. The union generally has provided much of the impetus for this project and continues to do so.

Project Development

The Joint Labor-Management Committee, termed the Joint Committee, was formed in March 1983 to guide development of the Midland Center. It was a full 18 months later that additional funding was made available for the Center's operation. The timing of receipt of funds has affected the Center's growth and ability to provide services. To provide some perspective on its growth, the following represents a brief funding history of the Center.

• Project Start-up with Private Funds	September 26, 1983
• Receipt* of Pennsylvania Title III Funds	September 1984
• Receipt* of Ohio Title III Funds	January 1985
• Receipt* of Federal Title III Discretionary Funds	March 1985
• Receipt* of West Virginia Title III Funds	Pending

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*Receipt refers to being able to draw down funds.

Until the Fall of 1984, project activity, as noted earlier, consisted almost entirely of job search classes. Staff consisted of the Director, a trainer ~~and~~ a ~~few~~ job developer, and a secretary. As funding availability has increased rapidly over the past six months, services and staff have increased as well.

At the time of this onsite review in March 1985, the Center was undertaking a substantial change in the general flow of participants. Previously, there were few participants entering the retraining or remedial education service tracks. The flow now is changing to reflect expanded assessment and remedial education and a greater availability of retraining. These changes are largely the result of recent funding developments.

Several changes have taken place over time in the Center's operation of the original job search component. At first, Job Clubs were used but were found not to be successful. Participants primarily were interested only in socializing with their previous co-workers and soon lost interest in coming to meetings. As a result of this initial experiment, the Job Club concept was dropped in favor of the current approach which emphasizes job search training alternated with one-on-one coaching of participants engaged in job search.

PROJECT ORGANIZATION AND MANAGEMENT

The Midland Center organization structure is simple. There are currently 10 staff members. All personnel report directly to the Center's Director. Overall direction of the project is determined by the Joint Labor-Management Committee which is comprised of equal numbers of union and management representatives.

There also is an advisory group that was formed.~~just recently.~~ This Advisory Council is not actively involved in the Center's operations. Its purpose is to provide a means by which to inform and involve the widest possible cross-section of community, academic and national interest group members. ~~It also provides technical assistance with fund raising~~.

Project staff appear to be notably enthusiastic and committed to their work, working long hours without complaint. The Project Director does look for certain characteristics in those persons hired for Center positions. For those persons who are involved directly in the employment and training activity, the Center requires a minimum of a college degree and tries, to the extent possible, to hire former Crucible employees. The Director lays out the commitment the job involves and watches for a reaction from the prospective employee. Generally, a goal directed, achieving personality and a willingess to learn are the desirable traits that are required to become a member of the Center's employment and training staff.

For personnel more involved in the management of the project, the Director looks for past experience in a related field, an entrepreneurial spirit and client empathy.

Most of the Center's staff currently are enrolled in formal educational programs. Several are earning advanced degrees in Human Resource Management. The Center's two counselors already have advanced degrees.

The Center has little direct involvement with other employment and training agencies. The New Brighton Job Service does provide microfiche and a list of demand occupations. It used to perform eligibility screening but that activity was discontinued because of scheduling problems and the fee which Job Service charged for each applicant it screened. Although the PIC concurred in regard to the submission of the Center's funding proposal, it was not involved in most other activities. The only other involvement the Center had with the PIC or Service Delivery Areas was to refer to the SDA individuals who were not eligible for Center-sponsored retraining. The Center does plan, however, to bring both the Job Service and the SDA into a joint campaign to identify prospective clients for jobs with the new company locating in Midland. The Center does not have 350 participants to refer even though they have the exclusive contract for placement at the new company's facility. Therefore, the Center has elected to engage the services of these neighboring agencies.

While it is not an employment and training function, the public relations activity is central to understanding the Midland Center. A full time public relations person was hired in January 1984 to assist in promoting the Center's projects. The principal public relations activities consist of the preparation of news releases, press conference materials, a monthly newsletter -- "The Midland File," and brochures. There also are special events supported by the Center's public relations component. "Spring Fling," 1984, for example included free entertainment, food, carnival, games and balloon releases. This year's special event will be a craft show for former Crucible employees and their spouses to show and sell their work. The purpose of these events is both to alleviate boredom among the community's unemployed workers and to generate publicity for the project.

Public relations materials are prepared and packaged to present a very professional image. This package includes "The Midland File," a collection of materials in a plastic-covered, three-ring binder developed for distribution to employers and other potential supporters of the Center's program.

PARTICIPANT CHARACTERISTICS

Although participant eligibility actually includes all dislocated workers, 90 percent of the reemployment project's participants are former steelworkers. Little information presently is available on actual participant characteristics. The Project Director believes that the Center's participants generally are similar to those of the overall Crucible population. The Carnegie-Mellon University Center for Labor Studies conducted a survey of the former employees of the Midland Crucible Steel Plant between December 14, 1983 and January 20, 1984. A sample of 518 displaced workers was drawn from a total population of approximately 4,300 workers. The results of that survey suggest that the typical dislocated steelworker is a white male between the ages of ~~30-34~~ who has a high school diploma and is a resident of Ohio. He is likely to be married with four dependents and owns his home with a one to five year mortgage. There is a 51.6 percent probability that he is a veteran and has worked six to ten years for the Crucible plant prior to layoff. At the time of the survey, he had been laid off for a period of 19-24 months. His principle means of support at that time consisted of food stamps and company pension benefits. He still continues to be the principle source of income for his family.

The exhibits that follow are a series of tables which depict various aspects of this displaced worker population. Although Center staff believe that they probably are serving the middle third of this group, i.e., the third unable to get jobs but who are sufficiently motivated to take part in reemployment activities, they believe that this data fairly represents the participants served by the project.

Exhibit 2

Profile of Laid-Off Crucible Steel Workers

SECTION I: PERSONAL CHARACTERISTICS

I.A DEMOGRAPHICS

Table I.A.1: STATE OF RESIDENCE

		ALL
		100.0%
	N	518
OHIO	287	55.4%
PENNA	183	35.3%
W VA	48	9.3%

Table I.A.2: SEX OF RESPONDENT

		ALL
		100.0%
	N	518
MALE	486	93.8%
FEMALE	32	6.2%

Table I.A.3: RACE OF RESPONDENT

		ALL
		100.0%
	N	518
WHITE	478	92.3%
BLACK	31	6.0%
HISPANIC	9	1.7%

Table I.A.4: AGE OF RESPONDENT

		ALL
		100.0%
	N	518
Under 25	7	1.4%
25 to 29	69	13.3%
30 to 34	95	18.3%
35 to 39	73	14.1%
40 to 44	76	14.7%
45 to 49	67	12.9%
50 to 54	52	10.0%
55 to 59	51	9.8%
60 and up	28	5.4%

Table I.A.5: EDUCATION OF RESPONDENT

		ALL
		100.0%
	N	516
8	20	3.9%
9	10	1.9%
10	20	3.9%
11	12	2.3%
12	360	69.8%
13	33	6.4%
14	37	7.2%
15	14	2.7%
16	10	1.9%

I.B FAMILY COMPOSITION

Table I.B.1: MARITAL STATUS

		ALL
		100.0%
	N	518
NO SPOUSE	76	14.7%
SPOUSE	442	85.3%

Table I.B.2: TOTAL NUMBER OF DEPENDENTS
(including respondent)

	N	ALL 100.0% 518
1	50	9.7%
2	110	21.2%
3	99	19.1%
4	153	29.5%
5	73	14.1%
6	18	3.5%
7	10	1.9%
8	3	0.6%
9	2	0.4%

I.C HOUSING

Table I.C.1: TYPE OF HOUSING

	N	ALL 100.0% 517
RENT	87	16.8%
OWN	406	78.5%
LIVE WITH OTHERS	24	4.6%

Table I.C.2: TIME TO GO ON MORTGAGE
(Respondents owning or buying home only)

	N	ALL 100.0% 357
Paid off	66	18.5%
1-5 yrs	82	23.0%
6-10 yrs	68	19.0%
11-15 yrs	62	17.4%
16-20 yrs	46	12.9%
21-25 yrs	29	8.1%
26+ yrs	4	1.1%

SECTION II: EMPLOYMENT HISTORY

Table II.A: MILITARY SERVICE

	N	ALL 100.0% 516
YES	266	51.6%
NO	250	48.4%

No females were veterans

Table II.B: LENGTH OF SERVICE AT CRUCIBLE

	N	ALL 100.0% 518
Under 6 yrs	71	13.7%
6-10 yrs	154	29.7%
11-15 yrs	44	8.5%
16-20 yrs	81	15.6%
21-25 yrs	44	8.5%
26-30 yrs	46	8.9%
31-35 yrs	47	9.1%
36+ yrs	31	6.0%

Table II.C.1: NUMBER OF MONTHS SINCE CRUCIBLE LAYOFF

	N	ALL 100.0% 509
0-12 mo	10	2.0%
13-18 mo	117	23.0%
19-24 mo	244	47.9%
25-30 mo	77	15.1%
31-36 mo	46	9.0%
37+ mo	15	2.9%

Table II.C.2: REPORTED ELIGIBILITY FOR TRA AND TAA BENEFITS

	N	ALL 100.0% 515
YES	145	28.2%
NO	202	39.2%
DON'T KNOW	168	30.8%

Table II.C.3: NEW JOB REPORTED

	N	ALL 100.0% 517
YES	114	22.1%
NO	403	77.9%

Table II.C.4: SUCCESS IN FINDING A NEW JOB

	N	ALL 100.0% 518
F/T perm	18	3.5%
F/T temp	5	1.0%
F/T unspec	15	2.9%
P/T perm	3	0.6%
P/T temp	11	2.1%
P/T unspec	23	4.4%
Unspec perm	4	0.8%
Unspec temp	20	3.9%
No details	14	2.7%

SECTION III. CURRENT STATUS OF WORKERS

III.A SOURCES OF INCOME

Table III.A: PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC TYPES OF PENSIONS, UNEMPLOYMENT/RETRAINING BENEFITS, AND TRANSFER PAYMENTS

		ALL
		100.0%
	N	516
Cruc pens	161	31.2%
Soc secur	19	3.7%
Other pens	4	0.8%
Unemploymt	39	7.6%
SUB	10	1.9%
TAA	13	2.5%
TRA	5	1.0%
VA eductn	2	0.4%
Food stamps	100	19.4%
Welfare	46	8.9%
Medicaid	40	7.7%
S&S relief	7	1.4%
No benefits No job	116	22.5%

III.B MEDICAL INSURANCE

Table III.B.1: TYPES OF CURRENT MEDICAL INSURANCE COVERAGE REPORTED

		ALL
		100.0%
	N	518
Crucible	173	33.4%
Spouse	59	11.4%
Personal	59	11.4%
Employer	44	8.5%
Medicaid	40	7.7%
None	151	29.2%

III.C FAMILY SUPPORT

Table III.C.1: PRINCIPAL SOURCE OF FAMILY NCOME

FORMERLY	N	ALL 100.0% 514
YES	481	93.6%
NO	33	6.4%

CURRENTLY	N	ALL 100.0% 513
YES	371	72.3%
NO	142	27.7%

Table III.C.2: SPOUSE SEEKING EMPLOYMENT

	N	ALL 100.0% 423
YES	200	47.3%
NO	223	52.7%

SECTION IV: TRAINING

Table IV.A: PERCENTAGE OF RESPONDENTS REPORTING SPECIFIC TYPES OF FORMAL TRAINING AND ON-JOB TRAINING

	N	ALL 100.0% 518
College	81	15.6%
Technical	54	10.4%
Vocational	86	16.6%
Trade	27	5.2%
Other	16	3.1%
Apprentice	18	3.5%
On-job	144	27.8%
Military	166	32.0%

NEEDS QUESTIONNAIRES

	OHIO	PA	W VA
TOTALS*	280	178	45
Brush up	223	111	17
Retraining	270	145	17
Entrepreneurship	175	104	15
Assistance in finding a job	258	161	26
Relocation assistance	89	76	10
Benefits	103	63	8
Child care	20	17	0
Health	99	58	6
VA	57	63	8
TRA	151	83	4
TAA	135	82	5
Bills	12	8	0
Stress	20	10	0
Legal	38	15	0
Utility	88	45	5
Food	69	31	2
Resume	141	130	5
Job search	169	100	11

PROJECT OUTCOMES

Enrollment in Center activities, in total and by state of resident, has been as follows:

Total	Penn	Ohio	West Virginia
~~470~~	~~362~~	~~83~~	~~25~~
647	353	267	27

It is expected that enrollment in the Center's program now will increase rapidly with the availability of Title III discretionary funds. In addition, there are plans to open a satellite operation in ~~Aliguippa~~ Aliquippa due to a ~~plant~~ reduction in ~~closing~~ there. This will increase Center enrollments as well. ✓ ~~A new funding proposal~~ ~~is~~ ~~being prepared to finance the~~ ~~Aliguippa~~ Aliquippa ~~effort.~~ Existing DOL Discretionary funds will be used for start-up with*

The primary goal of the project is, of course, reemployment for laid-off participants. Given the duration of the period of unemployment and the shortage of jobs in the Midland area, however, the Center also has broader concerns. There has been, and continues to be, considerable emphasis on the family — with employment and training assistance being provided to family members of laid-off steelworkers. Plans are underway to establish a Displaced Homemaker program for 500 former wives of steelworkers. The Center also is working with the current mill owner, LTV, to open a medical center for the community.

The Center has been defining placements by their own standard, ~~not~~ as well as the JTPA standard. Follow-up is performed monthly on those placed. If follow-up finds that the individual is unemployed, that person no longer is counted as a placement. At one point, using this system, the project was reporting about a 52 percent placement rate. An audit by the State of Pennsylvania resulted in a determination that the Center's actual placement rate was 100 percent, using JTPA standards.

Through February 1985, project statistics (using Center standards) were as follows:

	Participants	Placed (Working)	In School (Currently)
Penn	329	136	29
Ohio	236	102	26
West Va.	25	16	3
TOTAL	590	254	58

Those former participants working locally earn an average wage of $6.62 per hour in their new jobs compared to $9.20 per hour for those participants who have relocated.

SIGNIFICANT FINDINGS AND CONCLUSIONS

There are a number of findings of significance from this study. The most impressive finding is the existence of the Center itself. Midland Center is a good example of what determined people and local initiative can accomplish. With no discernable resource, USWA members parlayed their negotiating leverage into a $300,000 subsidy for a reemployment program from the new plant owners, LTV. From that beginning, they garnered support and financial assistance from state and federal agencies and private contributors. Over a ~~three~~ two year period, they have amassed a budget of $2,500,000 and have evolved into a multi-service center that both creates jobs and provides training for jobs. This effort was led by local residents, not government task forces or consultants. In this respect, it is a classic example of community activism.

The second finding of note is the close integration of the project with the surrounding community. The Center, for example, is as much involved in setting up a community medical center as it is involved in job training. The synergistic relationship between the Center and the community benefits everyone. The training program has easy access to new jobs generated by the local government's economic development efforts and the community has, in the Midland Center's training component, an important economic development asset. The community also benefits from the improved morale inspired in part by the promise of new jobs and in part by an institutional symbol of regard for the plight of the laid-off workers.

The need for remedial education is a significant finding in light of the high percentage of laid-off steelworkers who had a high school diploma. This may mean that the less educated steelworker is more likely to be included in a training program. At the same time, it may indicate that workers are not able to keep up with the rapid changes in our educational curriculums or to use any previous training while laid off. Thus workers may require remedial education before entering retraining programs.

In discussing the program's clientele, the instructor points out that many long-term Crucible employees learn by doing. It is sometimes difficult to convince them that employers place considerable emphasis on "book learning." Motivating participants to learn is a large part of the Center's education task. Upon making progress, however, learning becomes an accomplishment in itself and gives participants needed confidence and enthusiasm.

The extensive involvement of the union and the present plant owner is another finding of importance to this study. The success of this project can be attributed largely to the leadership of the former and the generosity of the latter. The ~~USWA~~ USWA has demonstrated unusual effectiveness in organizing and supporting the Midland Center primarily in terms of linking the project to external resources LTV's substantial financial contributions. The intense involvement of its personnel are even more remarkable when one considers the relatively small investment it has in the 300 person stainless steel plant and the fact that it was not involved in the layoffs that precipitated the dislocation problems.

Overall, the Midland Center is the embodiment of the "bootstrap" philosophy applied to worker dislocation. It demonstrates a resistance to arbitrary labels and the constraints such labels generally impose on a project. It is free to pursue any strategy or objective that seems appropriate to meet the needs of the laid-off workers—a food store cooperative, a medical center, a displaced homemaker program or a crafts fair. This is largely the result of not being totally dependent upon government funds and the limitations inevitably associated with government largesse.

Mr. Volkmer. Thank you very much, Dr. Roblin. I have a few questions and then I am going to have to excuse myself a little bit to make some calls back to my office.

Your statement makes some concern about the effectiveness, and I know others in the steel industry are also, the Steel Import Restriction Act as being administered, we passed in the Congress and the President supported. And you cited import figures showing imports provided 26 percent of demand through May and I do not think anyone will disagree with that figure.

Economist Hobart Rowen in his column, "Economic Impact," says it is not due entirely to the failure of the program but some of the steel is already in shipment. I suppose many of the countries anticipating some of this, tried to get orders, quick and anticipated. At least they had some of the stuff, as I understand it, on the high seas before the program was ever announced. Some of the agreements were not signed until February. I guess we just recently signed agreements, I think, with France and Germany.

How would you respond to these comments?

Dr. Roblin. Well, I think those comments are basically true. But the comment as far as steel being on the high seas I think misses the mark a little bit, in that I think the program was designed to have, let us say, a late start. The program started in October. Any steel that left the countries of origin in October, which I think was the regulation under which this was set up, should certainly be here by this time.

You are right that agreements have been slower in being negotiated and signed than was expected. Nonetheless, while they have been delayed in their negotiations, the steel has continued to pour into this country. And I guess my only statement would be that regardless of the reasons that we are where we are, we are where we are. And if we are going to come anywhere close to the guidelines that were set up for 1985, there is going to be a monumental job of enforcement required in the second half of this year.

Mr. Volkmer. Well I want to assure you that I know some of us in the Congress are going to continue to monitor it. And if it does not get down, we may have to do something else to try and strengthen it.

Within LTV you have, in the steel division, you have, what, four divisions?

Dr. Roblin. We have three divisions.

Mr. Volkmer. Three divisions.

Dr. Roblin. Yes.

Mr. Volkmer. If one is profitable and the other is not, is there a transfer of that or if one needs—do you help each other out as far as borrowing money or anything like that?

Dr. Roblin. From the standpoint of a strategic planning company, I would expect that that would be the case. That is an academic answer because to this point we have not been profitable during the existence of those three companies.

Mr. Volkmer. I understand that.—

Dr. Roblin. But that would be the intent. That we would be able to transfer from one to the other.

Mr. Volkmer. OK. You also point out in the latter part of your testimony your retraining efforts. And I think you are to be commended for that. I read in one report that retraining is not something that is for the past employees, but is for future employees and it would continue to modernize. We are still going to be retraining possibly 5 years, 6 years, 10 years from now, is that correct? Do you agree with that?

Dr. ROBLIN. Yes. I think as the steel industry changes, and it is becoming a more dynamic industry all the time, there would be more retraining.

Mr. VOLKMER. Would you envision that you would retrain existing employees who are presently there rather than saying good-bye to those and retraining other people or bring in other people who are already trained for those type things?

Dr. ROBLIN. I would think that would be the preference, certainly.

Mr. VOLKMER. To retrain?

Dr. ROBLIN. Existing employees. Yes.

Mr. VOLKMER. For those who could be retrained into handling computerized or robotics or that type of thing?

Dr. ROBLIN. Absolutely.

Mr. VOLKMER. Very good.

Dr. ROBLIN. As I mentioned, the statistical process control is quite a sophisticated technique. And people who probably, when they started their jobs with LTV Steel, never thought they would be involved in statistics, are now quoting means and standard deviations and plotting them right on that equipment.

Mr. VOLKMER. Well, I know one that has had a little bit of experience. We had recently just opened up, a little over a year ago, a new GM [General Motors] plant in my district. And probably one of the most—it had more robotics in it than any other vehicle, motor vehicle, plant. And they retrained UAW [United Auto Workers] employees, former employees, and are using them.

I am sure as you develop your plans for the future, you project the needs of steel and the types of steel, do you not?

Dr. ROBLIN. We attempt to, yes, sir.

Mr. VOLKMER. Does that give you any concerns at this time in regard to not only the question of imports but also the competition from the aluminum, plastics, corrugated boxing and that type of thing?

Dr. ROBLIN. We certainly recognize the competition from substitute materials. The ones that you mentioned; glass is another one. And as we become more competitive and more able to compete with foreign steel products, we will, as a necessary byproduct of that, be equally better equipped to compete with substitute materials.

Mr. VOLKMER. And you are in competition right in this own country with substitute materials.

Dr. ROBLIN. That is correct. Somebody mentioned earlier the possibility of plastic auto bodies such as are in the Corvette and are in the Fiero. Yes, that is very live.

Mr. VOLKMER. Yes. And they are talking about the Saturn that basically I think will be similar.

As we look back on history, I have come to the conclusion, and correct me if you have a different opinion, that the steel industry following the Second World War and up through the 1950's and to the early 1960's, at least mid 1960's, was basically a captive industry. I mean it had the rest of the United States a captive. Do you agree with that?

Dr. ROBLIN. As far as attitude was concerned, certainly. We were the leading industry in the world, the leading steel industry in the world.

Mr. VOLKMER. But I mean if I was an automobile manufacturer and I wanted steel, I got it from the U.S. steel industry, period. Or if I wanted to make refrigerators or anything else out of steel, I got it from the U.S. steel industry. And that was it.

Do you ever envision that returning?

Dr. ROBLIN. No, sir, I do not.

Mr. VOLKMER. All right. You are in competition now to stay?

Dr. ROBLIN. We are in competition to stay. I would second Mr. Robins' remarks this morning that we are in competition to regain our own market first, but I do not see any reason why long term we should not recognize the world as a viable market for the American steel products.

Mr. VOLKMER. That was what I was going to ask, because I meant to ask Mr. Robins that. If we are able to do the things that we can hopefully do in research and possibly come up with new technologies and leapfrog some of the other countries, do you envision that possibly we could become an exporter of steel in the future?

Dr. ROBLIN. Yes. As long as we have competitive advantages over another industry in another country, we will have the opportunity to compete in their markets, provided they are not subsidized by their governments to inhibit that competition.

Mr. VOLKMER. Well, my last question has to do with a statement, and I think it is a little bit contrary to Dr. Cantor, on steel intensity. Do you foresee—we have had a decline in the use of steel since 1972 in this country. I believe your testimony, you foresee a continuation of that decline.

Dr. ROBLIN. Yes, I do disagree with Dr. Cantor in that respect. And I am aware that there has been a leveling off in the last 3 years or so. But going back and attempting to analyze at least qualitatively what I see as the trends which caused that steel intensity decline, I do not see anything that is changing those trends. So I do not see any reason for it to decline.[1] And the fact that it has for the last 2 or 3 years does not dissuade me that it will not continue to decline in the future.

Mr. VOLKMER. Well, if it continues to decline then we will probably continue to see some closings of steel mills in this country.

Dr. ROBLIN. I am afraid that is right, yes, sir.

Mr. VOLKMER. Even if we were competitive. I mean if we cut off the imports altogether.

Dr. ROBLIN. The least competitive mills will probably be the ones that close.

Mr. VOLKMER. All right.

Dr. ROBLIN. Yes, sir.

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[1] See app. A.

Mr. VOLKMER. Those that are best able to provide the customer what he wants at the price that he wants.

Dr. ROBLIN. Will stay in business, yes. We would hope that eventually the answer to that would be to restore the sort of competitive advantages you were talking about where we could expand our markets beyond the continental United States and sell into other parts of the world.

Mr. VOLKMER. I want to thank you at this time. I am going to have to—I will recognize the gentleman from Ohio to take the Chair while I excuse myself very briefly. And I will recognize the gentleman from California before I leave and you can continue the questioning.

Mr. PACKARD. Thank you, Mr. Chairman. Mr. Roblin, many other industries—oil, auto, aircraft industries and there are many, many that have diversified into more current and new industries in an effort to balance out the problem that the steel industry is now feeling, where they appear to be getting a lot of competition from new products, new industries and new areas. Why has not the steel industry done that in the past, done more diversification to keep current with the things and to balance out their product lines and their investment dollars?

Dr. ROBLIN. Well, of course they have done some of it. Part of the reason they have not in recent years, I think, when many of them realized that it could be advantageous to them, has been the lack of capital to do it. Just as it takes capital to build facilities, of course it takes capital to diversify into a new line of business. That is perhaps the largest reason why they have not diversified more. The second would be just a philosophical commitment to steel business per se, to stay within the steel business. Some companies prefer to do that.

Mr. PACKARD. Is not that a little bit though like having the head in the sand and not seeing the real picture in today's modern society, where those companies that have diversified and balanced out their product lines and so forth, seem to be doing better than those that have remained parochial in their own industry—particularly steel? It would have been natural for them to have moved into the plastics and into the ceramics and into those areas where technology have shown that—I think perhaps the signs were there long in advance of the conditions as they now exist, that those would become significant competitors to the steel industry. And even today we see that becoming the frontier perhaps more than steel becoming a frontier. And I would assume that some of the management decisions would have led them to that kind of diversity, like some of our automobile industries are doing now, getting into space and other kinds of industries.

Dr. ROBLIN. Well I would certainly agree with that position. As I say, I think some of the managements that did reach that position were inhibited in their ability to do that by their lack of capital funds.

Mr. PACKARD. Well, it is well known that new technology in the steel industry is diffused worldwide rather quickly and we have discussed that already this morning in the hearing. What assurances do you feel, as a representative of the industry, that the leapfrog technology will not as quickly catch hold in foreign competitive countries as within our own country and our own industry? And how long do you expect that you would have that leapfrog advantage before we found foreign competition catching up?

Dr. ROBLIN. I think the concept of developing technologies which utilize some of the advantages that we have—coal was mentioned as something that we have to an extent that other people do not have—is a sound basis for doing that. Lacking that sort of a natural superiority, let us say, I would think that within 5 to 8 years after the commercialization of a new technology in this country, it could be commercialized some place else.

Mr. PACKARD. What effect do you think that the leapfrog technology, if it is implemented, will have upon the labor market?

Dr. ROBLIN. It will require fewer workers, but more highly skilled workers. Workers that will be more highly trained than we now have them, workers who are more capable to operate an entire process rather than a piece of equipment.

Mr. PACKARD. If that is true, what do you expect then will be the attitude of labor and labor unions in regard to move forward with the technology?

Dr. ROBLIN. I would hope that——

Mr. PACKARD. If in fact what you have said may—would be perceived as the facts in terms of lessening the need for unskilled labor.

Dr. ROBLIN. I would hope that labor would agree that that sort of improvement and change is the only solution. That sort of improvement and change will go on in other places in the world, whether it goes on in the United States or not. And if we want to save any of our industry and any of our jobs, we are going to have to get ahead of that change and lead it.

Mr. PACKARD. Do you think that the high cost of labor has contributed to the industry's woes?

Dr. ROBLIN. High costs are certainly one of the big disadvantages, competitive disadvantages that our industry suffers.

Mr. PACKARD. How long do you think it will be before that balances out with our competitive—our foreign competitors? If ever.

Dr. ROBLIN. Top of the head guess would be on the order of 10 years, something of that sort.

Mr. PACKARD. What will bring about the lowering of our wage scales or the lifting of their wage scales to make that portion of the problem competitive?

Dr. ROBLIN. There will be an improvement in the standards of living worldwide that will raise their wage scales but at a very slow rate. I think that we will, in our industry, through renegotiations, change our entire wage structure in order to—I hate to use the term "lower our wage scales," because I am not sure that lowering our wage scales is what is needed. I think what is needed is a different structure of wages so that in the times when the industry is suffering poor business conditions, that the employees also take their belts in a little bit. So that we can have people who will work for fewer dollars per month and fewer dollars per hour and hopefully have more people working rather than people laid off.

Mr. PACKARD. What will be done with the residue of the employees or those that are unemployed if technology tends to erode the need for the numbers of employees that we now—that has historically been the case in the industry; what role will the companies take in retraining or replacing or relocating those employees?

Dr. ROBLIN. The sorts of things that I have described that have happened in Midland, in Warren, MI, and in other plants such as LTV has had to close down in the past, I think that is the sort of thing that we can expect our companies to do. Additional retraining for work not only in the steel industry, in this modernized steel industry, but the type of retraining which will make a worker who perhaps has worked all his life in the steel industry, more marketable to another industry.

Mr. PACKARD. So you feel that the companies will do their part in retraining and—

Dr. ROBLIN. No doubt about it in my opinion.

Mr. PACKARD. Other than outdated facilities, what are the principal causes of the financial problems that beset the industry now? Would you please discuss the effects of the trade policies, the tax policies, the antitrust policies and the union and subsidization of foreign steel industries have had? That is a broad question but obviously not one single problem has caused the—

Dr. ROBLIN. No, that is correct. Certainly, again, as we have stated before, high cost is the problem. We are not able to compete on the basis of costs. I think it is generally recognized that we now can compete on the basis of quality. That our quality in the industry is generally as good as it is anywhere in the world. So the costs are the problem. Labor cost is one of the items that you mentioned. As I cited in my testimony, we have taken great strides with help from the workers and help from the union to improve our productivity to where, again, we are the most productive steel producing industry in the world—even more productive than the Japanese in terms of man-hours per ton. That there be additional improvement in that area, there has got to be. But you come to a point of diminishing returns, where you have to deal with the wage rates as well.

I guess I would not feel myself confident to comment in any detail on the effects of tax policies and so forth.

Mr. PACKARD. What about trade?

Dr. ROBLIN. Trade policies, certainly; I mentioned that before. That allowing steel products, and other products, too, to come into this country at costs below—at prices below their cost of manufacture and in violation of our trade laws, is the thing which has—at a time when I think competition would have restored the industry, has pushed us deeper into the morass. Competition, as Dr. Cantor cited, competition is something that was not an active force perhaps in the industry once upon a time. But the markets for steel have become very competitive and our industry has recognized it. And I think without the onslaught of imports that have come into this country in the last 5 years or so, that our industry would be much more competitive today. It would have rectified a lot of those problems. But we have been prevented by having upward of 30 percent of our market taken from us, the largest market in the world.

Mr. PACKARD. Capital and the ability to finance the improvements necessary are very serious needs for companies to survive. What would your company—what is the most likely resource for capital improvement for your company?

Dr. ROBLIN. We have heard before about the possibilities of joint ventures and various financial legerdemain, I would call it. The cornerstone of any capital program for any industry has got to be profits. It has got to be a profitable industry in order to build—to modernize itself and be a competitive industry. There will be and, as I indicated, we have done some in the joint venture area, but basically it has got to be cash flow and the cash flow has got to consist of profits.

Mr. PACKARD. One last question, Mr. Chairman. If the Federal Government does step in and assist the industry and companies in their research programs and perhaps, maybe even Congress being willing, that they would perhaps do some other methods of subsidizing a struggling industry; what assurances do we have that the companies would not—or would use that benefit here locally or here within our communities and within this country and not take their productions overseas and further undermine the employment problem as well as the competitive problem?

Dr. ROBLIN. As I indicated in my written testimony, we have recently talked to some of our customers who have similar problems to us with respect to imports, and have had pointed out by them the disadvantages of overseas sources of materials, overseas sources of finished products and so forth. The fact that you have got language difficulties, communications difficulties; you've got government policies with a government over which we have even less control than our own Government, are all disadvantages to trying to do business overseas to supply a domestic market. I think the best assurance that you would have that the money would be spent in this country rather than abroad is that it just makes good business sense to do it here. If it could be done economically and competitively in this country, there is no reason to do it abroad.

Mr. PACKARD. May I carry that last question one step further? A good deal of our scrap metal has been purchased by overseas competitors and put into product lines and then of course come back as imports. Why hasn't the industry done more to try to capture and keep the scrap steel and metal industry here? Now some of the minicompanies are doing that more and more, but it would appear to me that some of the major companies would do the same.

Dr. ROBLIN. I think part of the reason that—you are right, some of the major companies already do do some of this. But the limitation on it is processing limitation. There is a limit to how much scrap can be used to make steel. The electric furnaces are one melting method that relies primarily on scrap. But the other melting furnaces are limited in their ability to use scrap. They can use only roughly 20 percent of their charge as scrap. So this has limited steel companies from doing more along that line.

Mr. PACKARD. And that is what has led to the minicompanies emerging.

Dr. ROBLIN. That is correct.

Mr. PACKARD. How much steel—

Dr. ROBLIN. In addition, commitment to raw material supplies, commitment to iron ore.

Mr. PACKARD. How much scrap in this country—do you see going out of this country?

Dr. ROBLIN. I do not know that.

Mr. **Packard**. OK. Thank you, Mr. Chairman.

Mr. **Traficant**. Yes, Dr. Roblin, I have a few questions. Some of them will be right to the point and some will be open for your discussion certainly. It is very interesting in listening to and reading through your written testimony here.

I have a couple of specific questions and they are in line with many reports that you hear from time to time being the fact that we are a steel-producing, and were once a very prominent, steel-producing community. The reports that have come out of the steel industry concerning our area I think you are probably more familiar with the situation in this area than probably most of the people who testify here today.

Let me ask you this: Of your total sales, how much of it was in the form of steel exports to other countries?

Dr. **Roblin**. Very little. I could not give you an actual number.

Mr. **Traficant**. Any?

Dr. **Roblin**. Not that I am aware of.

Mr. **Traficant**. There have been some reports that LTV has a steel plant and holdings in Mexico. Is there any truth to that?

Dr. **Roblin**. There is.[1]

Mr. **Traficant**. What plant do you own in Mexico?

Dr. **Roblin**. It is a small galvanizing plant.

Mr. **Traficant**. Where is that plant?

Dr. **Roblin**. I do not know.

Mr. **Traficant**. Do you know if the production there in that Mexican plant, if most of the percentage of that plant, the production of that plant, is shipped back to the States?

Dr. **Roblin**. I do not know.

Mr. **Traficant**. Do you know if that Mexican plant has export sales throughout the world?

Dr. **Roblin**. No, I do not. I would suspect it does not, but I do not know.

Mr. **Traficant**. They sell to Mexico?

Dr. **Roblin**. Well, that is true. I would consider in Mexico it would be domestic sales. That would be their domestic sales.

Mr. **Traficant**. Or do you import your American steel produced in Mexico back to America and sell it in the States?

Dr. **Roblin**. We do not.

Mr. **Traficant**. What do you do with the Mexican steel?

Dr. **Roblin**. I am not familiar with that operation, Mr. Traficant. I cannot answer questions on it.

Mr. **Traficant**. Could you please, for the committee's sake, please have whomever is responsible within the LTV Corp. present to the committee those particular questions and answer those questions in writing so they can be reviewed?

[No response from Dr. Roblin.] [2]

[The requested information will be found in app. A.]

Mr. **Traficant**. Dr. Roblin, do you have any knowledge or are there in fact any signed documents or contracts existing for long-term or continuous relationship of purchase from a foreign steelmaker?

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[1] See app. A.

[2] See app. A.

Dr. ROBLIN. I am certainly not aware of any.

Mr. TRAFICANT. In your position, would you have access and should you be aware of that?

Dr. ROBLIN. No, as I tried to indicate in my written and my oral testimony, my responsibilities include setting up planning procedures and working with the presidents of the various companies to help them do their planning and to coordinate the planning between the companies.

Mr. TRAFICANT Then in response to that and in line with that, one of the items that was requested and one of the areas you addressed in your testimony, and you have touched on already, was the process by which LTV would decide, and what process it takes when it decides to close one of its operations. Now I know that it is not totally your bailiwick as far as those decisions are made; but I am asking now specifically about the decision to close down the Aliquippa works and whether or not the testimony that you had delivered here in writing and that you have surfaced with at least today in your own verbal testimony, if that particular process was employed when that decision was made in Aliquippa.

Dr. ROBLIN. Which process? The process that I have described?

Mr. TRAFICANT. Yes.

Dr. ROBLIN. Yes; again, to answer your first question, I would not have been intimately familiar with those decisions. Those decisions would have been made in the various operating companies. We have, and I included as part of my testimony, Mr. Hays' speech and announcement that described the process of closing the Aliquippa works. I have in addition brought with me, copies of a full page ad which had been taken out in the Wall Street Journal and the other publications describing this. Beyond that, I do not think I have any details that I could—that I am aware of that I could give you.

[The information referred to follows:]

The Aliquippa tragedy

What unfair trade has done to an American community

Aliquippa, Pennsylvania. The latest victim of unfairly traded steel imports.
Foreign steel, unfairly subsidized and unfairly dumped, is the principal culprit behind what's happened at the once-mighty Aliquippa Steel Works of LTV Steel.
But there are other imports, threatening other industries just as vital to America.
Textiles. Chemicals. Energy. Silicon Valley. The list goes on and on.
How many more Aliquippas before this country moves to enforce fair trade?

One of the most disheartening tasks for a company is to announce the idling of a plant. It's not a question of bricks and mortar—we are talking about people's lives.

On May 17, LTV Steel Company gave notice to 1300 employees that most operations at the Aliquippa Works will be idled indefinitely.

This was a plant where in 1981 almost 10,000 people worked, forming the economic backbone of an entire community. This was a plant where photographers came to capture America's industrial might, and where the most productive steelmakers in the world made high-quality products to meet the world's demand.

Most important of all, this was a plant where $600 million was spent, most of it in the last 10 years, to modernize facilities and remain competitive.

LTV Steel has done everything possible to keep this plant going. But our losses in the first quarter of this year alone are estimated at $25 million. Over the last several years, product after product has been dropped; unit after unit shut down; employee after employee laid off. The community of Aliquippa has been crippled in the process.

Why did this grim change come about? Will there be more plant idlings in the steel industry like this one? The answer is yes—*unless America acts.*

We cannot say that every management move at LTV was correct. We cannot ignore the increase in steel-substitute products. And we cannot deny that costs—including employment costs—reached high levels.

Still, the truest answer to Aliquippa's trauma lies not in Pennsylvania, but overseas.

Unfair foreign competition, in the form of subsidized and "dumped" steel, intruded on product lines of steel bars, oilfield pipe and casing, continuous weld pipe, rod and wire, light structural steel, fence wire, and even nails—until we could no longer compete. What was finally left—pipe—now has an import penetration level of more than 60%.

LTV Steel, as well as the entire steel industry, has been pleading for fair treatment under our existing trade laws. Not protectionism, but fair trade. We can compete with anyone in the world in quality and price—*if* we all play by the same rules.

Last September, the Administration announced a plan to curb steel imports to the 18.5% level. Although this is a commitment to give away 18.5% of the U.S. market right off the top, we supported it in the best interests of all Americans and our trading partners.

But despite the considerable efforts of U.S. trade negotiators, little has happened. In fact, steel imports soared to the 30% level in January.

Unless these imports are curbed now, there will be more Aliquippas. Soon.

LTV Steel will continue to press for fair trade. All we want, and all our employees want, is a fair fight.

LTV The LTV Corporation

AEROSPACE/DEFENSE · ENERGY · STEEL

Mr. Traficant. Well, fine then. Along that line, and in line with the ad that was placed, I think it is within the ad and I quote some of the language within that ad:

> But most important of all, this was a plant where $600 million was spent, most of it in the last 10 years, to modernize facilities and remain competitive.

To the best of your knowledge, what is the status of that $600 million investment as far as machinery and equipment is concerned? Is the equipment and machinery still there in Aliquippa?

Dr. Roblin. Yes, sir.

Mr. Traficant. It has not been shipped to any of your other steelmaking facilities?

Dr. Roblin. Again, not to my knowledge, no.

Mr. Traficant. Has any of the investment made in the Aliquippa plant, any of that equipment, machinery and/or any inventory items been shipped to Mexico through your Mexican plant? [1]

Dr. Roblin. I really would not have knowledge that would let me tell you whether it has or has not. I would doubt it very much.

Mr. Traficant. I do not mean to put you on the spot, but I guess if we are talking about American steel industry being able to compete, we must talk about a streamlined mode of operation. And I find it very difficult to conceive and even to fathom the thought, that a powerful corporation such as LTV would leave $600 million of an investment sitting in a plant in Aliquippa where there is no activity? Could you respond to that in your position?

Dr. Roblin. Other than to cite again the general process that is going on in the steel industry. The fact that the industry has not been able to compete and to earn money. I do not see what details I could provide that would answer your question. When you cannot sell the product, and as Dr. Cantor, I guess, indicated, roughly 60 percent of the tubular goods in this country are coming in via imports, when there is not enough demand for your product, you really do not have many choices. You can keep the equipment running and produce product which cannot be sold or you have to write it off and shut it down.

Mr. Traficant. Would you know then as far as that $600 million investment that was made in Aliquippa, were any of those funds obtained through any financing plans involving foreign sources?

Dr. Roblin. I would not know.

Mr. Traficant. Has the company made use of alternative financing like the lease/purchase agreement employed by Bethlehem Steel for its new continuous caster as we have heard described so many times now?

Dr. Roblin. Similar arrangements, yes. Are you referring to Aliquippa specifically?

Mr. Traficant. Yes.

Dr. Roblin. I do not know whether they have or not.

Mr. Traficant. In other phases of LTV's operations?

Dr. Roblin. Yes.

Mr. Traficant. Was the recent reorganization of your steel assets into three divisions carried out to make it easier to obtain financing for certain LTV units or to facilitate the sale or closing down of some of your facilities?

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[1] See Appendix A.

Dr. **Roblin**. I do not know that it was done for either of those purposes. It was done primarily to make the companies more responsive to their individual markets, rather than to have to work through a somewhat more general and more bulky bureaucracy.

Mr. **Traficant**. I do not mean to belabor that and I do not mean to be putting you on the spot; at least you have agreed to come down here. I would like to make it be known and incorporated into the testimony, the minutes here of this meeting, that Mr. Hoag was invited to attend and that there were some segments of LTV that were not too ecstatic about coming before the committee. So I am very glad that you have. I do not mean to be offensive by any stretch of the imagination.

Dr. **Roblin**. Well, as I said in my opening remarks, we are certainly anxious to cooperate with this committee because this committee is working, as we are, on solving the problem that is so very important.

Mr. **Traficant**. Very good; then maybe we can proceed in a couple other areas that would certainly satisfy me at least to a degree.

The Steel Import Stabilization Act requires that major steel producers invest their net cash flow in their steel operations. Dr. Cantor, he stated earlier that this standard is being met on many of the occasions he is familiar with.

Dr. Roblin, can we expect LTV to continue this pattern of investment during the 5 years of relief granted by the law?

Dr. **Roblin**. Yes, sir, I think so.

Mr. **Traficant**. Are you delaying any of those plans pending the situation around the import program that is now being discussed, the President's plan?

Dr. **Roblin**. Delaying modernization plans?

Mr. **Traficant**. Yes.

Dr. **Roblin**. No, sir.

Mr. **Traficant**. Is there any delay at all because of the position of the administration or of the Federal Government at this point relative to trade and/or any of those matters?

Dr. **Roblin**. No, sir.

Mr. **Traficant**. What role does the labor force play in LTV Steel's decisions regarding investment in new technologies?

Dr. **Roblin**. There has been a limited role as far as input into the adoption of new technologies. Very much along the lines that Mr. Robins said before. At a later stage, as we get into the implementation phase, then the labor people are brought in, as are other segments of the company.

Mr. **Traficant**. OK, just two other items real quick here, Chairman.

Your statement contains a discussion of the training programs for displaced workers at the Crucible works that you purchased. If I am not mistaken there were 4,300 of those workers so displaced.

First, I want to know how many total of the 4,300 participated in your program; and

Second of all, I want you to respond to the fact that you said the program has placed, "354 steelworkers in new jobs; given 133 skills training; and upgraded the skills of 161 in reading and mathematics."

My mathematics show this appears to be a little bit over 600 of those workers. There were 4,300. And that works out to about a retraining and/or accomplishment ratio of about 16 percent. Could you respond to that?

Dr. ROBLIN. I do not know how many participants there were. I could obtain that information for you. I have no figures as to how many of those workers have obtained other jobs without the use of the career development center.

[The requested information will be found in app. A.]

Mr. TRAFICANT. Does part of our problem with imports arise from the possibility that other governments have as their national policy keeping open steel plants as jobs programs? Have you ever asked, LTV that is, ever asked the Government for direct assistance to help with the steel industry so you can get back there on your feet? Have you ever broached that as a possible option as far as jobs programs and training and retraining, as perhaps some sort of an option? Have you ever asked for that kind of help direct?

Dr. ROBLIN. I do not know. I am not aware of any such request.

Mr. TRAFICANT. If there has ever been such a movement, would you make that available to us? Any documents that would support that?

[The requested information will be found in app. A.]

Mr. TRAFICANT. Mr. Chairman, I yield back to you. I am glad to see you back.

Mr. VOLKMER. You are running it, go ahead.

Mr. TRAFICANT. Any of the other members have a question? Mr. Packard, do you have a followup here?

Mr. PACKARD. No, thank you.

Mr. TRAFICANT. Mr. Volkmer?

Mr. VOLKMER. I would just like to ask, you mentioned here that you have the labor-management participation teams in operation in most of your facilities. Have you found that—I suppose the answer is that you found it very constructive—

Dr. ROBLIN. And very effectively. Very productive.

Mr. VOLKMER. And very productive?

Dr. ROBLIN. Yes, sir.

Mr. VOLKMER. And kind of smooth over transition with that?

Dr. ROBLIN. Very definitely.

Mr. VOLKMER. OK. You would recommend that type of thing to about anybody in the steel industry?

Dr. ROBLIN. We are very much in favor of it. A very big supporter of that as the way of the future to operate and run our plants.

Mr. VOLKMER. I have no further questions.

Mr. TRAFICANT. Just one last question. To the best of your knowledge, do you know if any equipment or machinery from the Mahoning Valley has been taken and moved to the Mexican plant?

Dr. ROBLIN. I have no knowledge of that being done, no, sir.[2]

Mr. TRAFICANT. Well, we appreciate the fact and we will wait for the data that has been asked of you here by the committee and we appreciate the fact that you have come in here, Doctor, and have been so kind to take the questions and give us your frank answers. So we excuse you and we thank you for being here with us.

Mr. VOLKMER. Thank you very much.

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[2] See Appendix A.

Mr. TRAFICANT. I think we will move on then with the third and final panel. And our final panel today has been drawn from surrounding areas and local communities to give us that local perspective on the problems caused by the steel industry's crisis. We welcome and we call now Mr. Donald French and Mr. Frank Valenta.

And while they are coming up here, Mr. French is the director of the Mahoning Valley Economic Development Corp. here in Youngstown, and he will describe for us the efforts being made to expand the area's economic base beyond steel. Mr. Valenta serves as director for district 28 of the United Steelworkers of America, and has been asked to tell us about the role steelworkers should play in the effort to modernize the industry. Both witnesses have also been asked to comment about programs to retrain workers who have little hope, as reported by some, of returning to their former jobs.

I say that Mr. Joseph Coyle, the director for district 27 of the Steelworkers Union here in Youngstown, was asked to testify also. I regret that this proved impossible. Therefore, I ask unanimous consent that the record be held open to receive his written statement, and that it be included in the record following the prepared statements of Mr. French and Mr. Valenta.

Mr. VOLKMER. Without objection.

[Mr. Coyle later decided not to include a statement due to circumstances involving the Wheeling-Pittsburgh labor dispute.]

Mr. TRAFICANT. As with the other witnesses, gentlemen, the statements you have provided will be a part of the record. Mr. French, if you would begin, please.

STATEMENT OF DONALD FRENCH, DIRECTOR, MAHONING VALLEY ECONOMIC DEVELOPMENT CORP., YOUNGSTOWN, OH

Mr. FRENCH. Representatives, ladies and gentlemen, it is with pleasure that the Mahoning Valley Economic Development Corp. comes before you this date to try to give you a little insight on the specific examples and conditions that exist in the valley and the efforts of revitalizing the Valley.

The written comments dated July 17 and previously distributed to you—I do not intend to go over those in detail today but will briefly summarize those and then allow more time for questions, which I understand you would like to do.

The Mahoning Valley Economic Development Corp. is a unique partnership. The partnership has been formed in a time of crisis, a time of crisis that none of us in this area really asked for but it was brought upon us. And the partnership that included members of the business community, the labor community, Government, and citizens, formed together in a nonprofit corporation with one goal in mind, and that is, trying to stimulate job creation in the private sector. That started in 1978 and culminated in the corporation. It has been in existence continuously since that time.

If I had to say one word as far as creation of jobs, because that is an awful popular subject and everybody gets on the bandwagon there, but the corporation has guided in on one word and that is "implementation." The corporation has not been interested in thinking about ideas, about what could have, what may have, where should we have been; but rather, what can we do today and what can we do tomorrow to help get jobs, the method of keeping our commerce in our community and the well-being of our community in the future. That implementation is what we have been mainly concerned with and continue to be over the period of time of the corporation's existence.

To date, over 100 companies in the valley have received direct financing assistance and through this assistance over 2,000 jobs have either been retained or created. And I mention retained and created for two purposes. One job lost is an awful hard job to replace. The retention of a job keeps an existing business or an existing company and an existing wage earner continuing on his or her vocation—and it is very, very important to mention and continue to emphasize the retention.

All types of companies that receive assistance do so through what we call tools, economic tools—and I do not know that there is any one magic one that is used to accomplish that. Whether it is a loan fund that is done in conjunction with a private lender to help a company receive financing for a new machine or building and help give them a break on some interest rates; whether it is a training program that helps a company to train a new employee and while the employee is becoming productive, to allow that employee to learn his job and make it more palatable on the company's bottom line and also on the employee; or whether it is some item like an inducement or incentive, such as creation of an industrial park or retention of a railroad or the building of an incubator building, whatever it may be, are all tools. I think that the most important thing that any community can do, and what we have tried to strive for, is to cooperate with all levels of the community. There is only limited resources in any community and we can only look to the Federal Government for a certain amount of that. The cooperation with local governments, including the city and the country, has been carried on, with the State of Ohio in many programs that are offered through the State, and the Federal Government including working with and assistance through the Congressman's office, and even into the private sector. Because we cannot forget, the Government by itself cannot do all of the creation of economics. The private sector, as we have talked about here today, is very integral and necessary, because without the private sector I guess we probably wouldn't be here.

I think the maximizing of all of our attributes is one of the areas that the corporation has keyed in mostly. When we talk about the areas' attributes we can talk of only three items that I am most aware of and talk about continuously. One, of our location. This community, while it suffers greatly in the economic situation we find ourself in, does not suffer from its geographic location, nor its ability to put transportation modes to work with that location—another one of our strong points. And we might mention that this highway system that we have here is a benefit that we have derived not only from local sources but the program that the Department of Transportation has had for many years. But we sit in a very good spot for that.

And then the third item that we sometimes forget, is our own work forces here. And we have talked about the unemployment and the problems that are here. But also the work ethic and the adaptability of the folks in this valley that have suffered and the ones that are working currently, has also been and will continue in the future to be our strong point.

I think that one of the best things that we can do is help to create and improve the conditions that would help and invite private investments and hopefully the research and development, the technology and development that you are talking about.

But nowhere do I see that the Government can be able to recreate or invest all the monies that are necessary for technical development and research and development. For instance, most of the companies that we finance fall within the range of 100 or less employees. And if you would ask the same question as you asked of the steel companies today, "What portion of your budget is invested into research and development?" it has to be very limited. Their budgets are limited. Their ability to survive and have a positive cash flow is of concern. Not that the innovativeness is not there in small companies. Many entrepreneurs have ideas and continually develop, but not to the extent with an ongoing committed research program that a large corporation has and should have.

You specifically asked about questions on retraining and I mentioned in the report several examples that were obtained from the local private industry councils which were formed under the Jobs Training Act. I do not intend to rediscuss those at this moment. But it appears of all the programs there, the on-the-job-training program seemed to work the best. You yourself have asked and discussed in other situations that even in the best of conditions with the on-the-job-training program, the displaced steelworker usually finds himself with an employee job, when he does, at a lower wage than he was able, him or her, was able to have in the beginning under the existing wage structure of the steel industry.

I do not know what the long-term advantage or long-term goal is of this committee but I know that here in the valley we do not want to change the lifestyle of people any more than necessary. And somebody that has had a lifestyle—not for just a few years, but for generations—it is very difficult to change that lifestyle and to take somebody earning whatever their wage was, $13 or $14 an hour, and talk about a wage that is 50 percent or less than that and continue the lifestyle, educate your children, put them through a university like this, and continue on with what we would like to do in the social and economic portion of the community. It is not possible. I am not sure in the short run what the answer is. I think in the long run we need to address the strengths of the valley; we need to take a look at the valley under the special conditions that exist here.

For instance, the unemployment survey that was recently completed by the university here and the Ohio Bureau of Employment Services indicated that a lot of the unemployment figures that you find published from the Department of Labor are certainly, and most likely, 50 percent higher than what you read. And when you start looking in the inner city, and I invite you to, when you leave here today, to take a drive through the inner city, to find that unemployment rates there probably go in the range of 25 to 50 percent. These are real problems. And the social problems that come out of that are very evident.

People, we find, are not interested in relocating, even though some of the programs offer relocation for certain cases and I think you can find statistics that say a small percentage of those people have relocated. But by and large, the family ties, the strong work ethic and, believe it or not, the desirability of living in this area, make it desirable on people to stay here and not leave.

In order to take a look at what we particularly need to do in the future here in the Valley, I think the best thing that the government, at whatever level, can do is help to make incentives available that would help create the atmosphere where private investment will take place. And hopefully that includes research and development, technology and development.

We need to take the advantage of our continuing education and training—and this certainly is not a short-term goal. The programs at the university here have developed in conjunction with the State of Ohio and the Federal Government; they need to be expanded and continued for long term assurances. This is not something that can affect a 50-year-old worker today, as your programs have indicated, although it does not exclude them. But it certainly can start looking at the children and the grandchildren, which are here and do not want to leave, and they want to prosper.

We need to continue to build on the labor-management partnership. The commitment to common goals. And believe me, from the days in the past and my short time of about 5 years here, we can certainly see a commitment by labor and management to work together. And that always was not the prevalent feeling of the Valley. But I certainly can see that now and we need to work on that, because if we do not work together, we certainly will not be working at all.

We also need to expand the tools. We are not asking the Federal Government to help us to do everything, but we do need some help to help ourselves. Certainly the world market we find ourselves in today was not one that we created, but it is one we have to live in. What assistance we can get is needed. We do not feel the level of assistance has been as high as the verbiage that has gone along with it.

That would complete my comments.

Mr. **Traficant**. Thank you Mr. French. Mr. Valenta.

[The prepared statement of Mr. French follows:]

MAHONING VALLEY
ECONOMIC DEVELOPMENT CORPORATION
3200 Belmont Avenue • Youngstown, Ohio 44505 • (216)759-3668

July 17, 1985

The Honorable Harold L. Volkmer, Chairman
U.S. House of Representatives
Committee on Science & Technology
Subcommittee on Investigations & Oversights
Room 822 House Annex I
300 New Jersey Avenue SE
Washington, D.C. 20515

RE: FIELD HEARING/YOUNGSTOWN, OHIO - JULY 22, 1985

Dear Representative Volkmer:

In response to your letter dated June 28, 1985 inviting the Mahoning Valley Economic Development Corporation (MVEDC) to testify at the Field Hearing of the Subcommittee on Investigations and Oversights, the corporation is most happy to accept your invitation to testify concerning "New Technology and the Future of Steel."

For your information, MVEDC is a unique partnership of business, industry, organized labor and government created with the advice and assistance of the U.S. Department of Commerce, Economic Development Administration. It serves both Mahoning and Trumbull Counties in Northeast Ohio.

MVEDC is the principal development organization in the two county metropolitan area and specializes in the implementation of programs and activities that will create permanent jobs in the private business sector. The corporation assists wherever possible in revitalization and diversification of the area's economic base and its program emphasizes the retention and expansion of firms already located here, as well as the attraction of new firms to the area.

MVEDC works in cooperation with governmental units, local chambers of commerce, other development organizations, realtors, developers, along with railroad and utility representatives on projects of mutual interest. The corporation is a private, non-profit corporation incorporated in the State of Ohio, Internal Revenue Code as a 501(c)3 corporation.

Subcommittee on Investigations &
Oversight
822 HOBA #1
Washington, DC 20515
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MVEDC provides services to companies and businesses in the Valley by way of financial assistance, providing site information, site selection studies, maintaining an existing inventory of available industrial buildings and sites, providing community data and assists in coordinating grants for local public works projects, as they affect economic development.

MVEDC also offers assistance to companies seeking financing from the State of Ohio and through the Department of Housing Urban Development (HUD) through the UDAG programs.

MVEDC has three affiliate corporations, two of which are developing 338 acres of prime industrial land into commerce parks and also has an affiliate that operates 2.75 miles of industrial railroad in Mahoning County.

The following responses address the information requested by the Committee:

What role should local and State governments play in the implementation of developing technologies that could assist in revitalizing the steel industry? You are most likely aware that resources of both local and state governments are limited in their ability to assist industry. Traditionally, the majority of research and development has been conducted by larger corporations which have not utilized government assistance to the extent that smaller companies have used such assistance. Local and State governments can assist all companies in a locality by improving conditions in the communities, making it more favorable for companies to consider investing necessary capital for research and new technology developments. Special incentives and inducements should be provided that would further induce companies to locate technology development activities within a specific area.

Currently available in the State of Ohio is the Thomas Alva Edison Program, which develops a partnership between industry and universities to create the condition and atmosphere necessary for technology development. While one of these centers is not currently located at the Youngstown State University (YSU), specific technology development relating to steel certainly could be considered.

Implementation of the Ohio Technology Transfer Organization, also funded by the State of Ohio, encourages local industries to take advantage of technological assistance which may exist through Ohio's universities and colleges. The Cushwa Center for Industrial Development and the Small Business Enterprise Center, both located at the university, serve the Valley by providing technological assistance to business and industry. The current development of a high tech computer center at the YSU also presents an opportunity for companies to interface state of the art electronic data processing systems with private industry applications. Inducements such as tax incentives, special investment incentives and low cost loans would be appropriate, as well as emphasizing the clustering of high technology companies into modern commerce parks.

The Committee requested a description of previous efforts involving local and State governments in assisting industry modernization. MVEDC, working in conjunction with other development groups and government agencies has developed an informal network to maximize available resources for economic revitalization. MVEDC's funding assistance programs have directly assisted over 100 companies through direct loans in cooperation not only with private lending institutions and private investment capital, but also cooperative lending programs developed with the City of Youngstown, Mahoning and Trumbull Counties, and the State of Ohio's various Direct Loan Assistance Programs.

MVEDC routinely refers and jointly develop prospect company business plans and project details with the YSU Cushwa Center for Industrial Development. The City of Youngstown has assisted companies by providing tax abatement in special enterprise zones and providing special interest subsidy loan programs. Infrastructure improvements that will help maintain and create an improved atmosphere for business and industrial development have been developed by counties and by the State, especially in the area of transportation facilities, bridges and roadways.

The State of Ohio has located a regional economic development office in the Mahoning Valley to expedite State assistance to companies. Cooperation with the U.S. Small Business Administration in utilizing the SCORE Program and Small Business Institute, both located at YSU, have assisted small business persons and entrepreneurs in counseling. SBA, through its SBA Section 503 Certified Development Companies, which both MVEDC and the Warren Area Planning Corporation operate, has assisted many area companies in conjunction with private banking corporations. Cooperation with various Community Improvement Corporations which, process industrial revenue bonds, also assist companies in financing construction projects. Special programs such as development of the Youngstown Commerce Park, the Warren Commerce Park and the Castlo Industrial Park encourages companies to locate, modernize and expand in developing areas close to interstate transportation.

A special program, MVEDC initiated, assisted four area companies from losing rail service. The resulting affiliated corporation, Economic Development Rail Corporation, now operates 2.75 miles of industrial railroad servicing five industrial companies on the west side of Youngstown and Austintown in Mahoning County. Through this effort, approximately 250 jobs were retained, and as a result several small expansions are occuring in the area served by the railroad.

What is the current economic climate in the Mahoning Valley? Published reports by the Department of Labor indicates unemployment rates in the Valley, Youngstown-Warren SMSA, vary between 11% and 12%.

Discussions with private companies, as well as the Ohio Bureau of Employment Services and Youngstown State University personnel who recently completed an indepth study of the subject, reveal actual unemployment rates are 50% higher than published rates, with unemployment rates among the minorities, especially the black intercity population falling within a range of 25%-50%.

Since the closing of steel mills started in the late 70's, revitalization and diversification has continued, but not to an extent to offset the workforce that lost employment through area major steel-making steel closings. Many companies that acted as suppliers to the steel industry either diversified, expanded marketing areas, contracted into smaller companies or in the worse case, ceased operations. It is felt that many companies have made the transition to the larger regional and national markets to take advantage of the area's greatest attribute, that of geographic location, coupled with an excellent interstate highway system. The current climate for development is better than five years ago, but needs improvement, not only from a self image perspective, but also as it is viewed nationally. This can only be accomplished by development of successful projects on a project by project basis.

What attempts have been made to replace steel facilities with other new industries? Marketing promotion programs on a national basis have been conducted in the Valley. The use of national and local advertising groups and media have been utilized and have resulted in a few successes. The attraction of new companies to the Valley or to any location is a highly competitive procedure. Many times the attributes of a community to attract a company go far beyond abilities of a community to fully control conditions necessary for company location. A current case in hand is the General Motors Saturn Project.

It has been proven that the majority of successes in historical job growth comes through diversification and expansion of small companies with less than 100 employees. In the Mahoning Valley, efforts to assist many small companies in the diversification effort have assisted in retaining or creating between 3,000-5,000 jobs. Special efforts such as industrial parks, rail corporations and incubator buildings encourage investment of private capital including venture capital.

What efforts have been made to retrain the steelworkers? Retraining in the public sector has mainly centered on the efforts of Private Industry Councils which were created by the Jobs Training Partnership Act of the Department of Labor. The most successful application of the programs seems to be the "on-the-job" training, where individual employees' wages are subsidized while the job is being learned. Some classroom training has also occurred. Specific examples include a Trumbull County company, the GATX Corporation, which closed. Out of 400 eligible Ohio workers, 85 have completed training programs and are currently employed with an average wage of $6.50/hr., another 144 remain in training. A pending program at another company, which is closing, will provide the 150 eligible employees with retraining possibilities. Fifty former Pollock Company employees in Youngstown will be eligible for training and placement. The types of jobs that have been created, not only through the special programs, but the normal Private Industry Council Program, seem to be concentrated in the area of service, some special mechanical applications for manufacturers and small jobs shops, and transporation employment relating mainly to truck transportation, a minor amount in clerical and technical positions. Other services such as attitudinal counseling helping individuals adjust a previous high wage earning ability to a lower wage future is offered. Other training is offered by the Ohio Vocational Consortium which assists in classroom training of existing workers. This has been applied mainly in the area of automotive and other manufacturing requiring a high level of quality control. Specific areas of applications include robotics, hydraulics, and pneumatics. Other individual company efforts have occurred on a limited basis. In many cases educational levels or skills of displaced workers are not high enough to readily qualify those persons for any available high paying jobs. In some cases, the existing skills of former high wage earners are obsolete and no longer marketable.

This completes questions raised by the committee. The Mahoning Valley Economic Development Corporation appreciates the opportunity to assist the committee in the studies of new technology in the future of steel. MVEDC certainly believes that the Mahoning Valley is a place for future development and new technology research and applications certainly would aid the economic revitalization effort.

Sincerely,

Donald L. French

Donald L. French
Executive Director

DLF/vp
Enc.

STATEMENT OF FRANK VALENTA, DIRECTOR, DISTRICT 28, UNITED STEELWORKERS, CLEVELAND, OH

Mr. VALENTA. Yes; distinguished members of the Subcommittee on Investigation and Oversight—and, Jim, I am certainly glad to see that you are on that committee—fellow panelists, and ladies and gentlemen, it is most appropriate that you are holding your hearing here in Youngstown because you are trying to find out what the problems are within the steel industry and you might say this is a town where we can point out that the problems probably originated. But if you would not have held your hearing here, there would have been a number of other cities that you could have held it in that are in likewise the same position as we are here in Youngstown. And of course that could have been Duquesne, Holmstead, and Johnstown. And one of the latest cities that we are having a tremendous amount of problems in happens to be Lorain, OH. That is also in my jurisdiction in district 28, which takes in almost all of northeastern Ohio. Lorain happens to have the big United States Steel plant there, pipe producing plant. And as you have heard here so far this morning, the pipe production in the United States is in serious trouble.

So it is great that you are holding it here to where we can have an opportunity to explain to you the real devastation, of course, that is taking place. I do not intend to read the statement that I submitted. There is a lot of what I heard here this morning that I took a few notes on and that I would like to make reference to in regards to my oral presentation.

But the steel industry today is certainly in peril. It is not just hemorrhaging, it is bleeding profusely. It is just a very, very serious situation. And the gentleman from LTV that just spoke, I had left the room for a period of time but I do not think I recall them saying anything in regards to the sale of their specialty steel division. It is on the block. And I happen to know LTV Steel real well. Basically because I spent some 9 years as the union side chairman in the J&L negotiations. And I recall very vividly when J&L at that time decided to pick up the Midland plant that had been shut down. That was a Colt Industries plant, stainless steel operations. And of course in talking to the higher ups of J&L they had indicated to me that they were really wanting to move in the direction of picking up a lot of operations within specialty steel. And so that they did. And the parties sat down and negotiated a most worthwhile contract.

So I believe that as far as LTV Steel is concerned, it is only really their specialty steel division that has been making any money. And for them to put that particular division up on the block for sale, I think, is an indication just how serious the problem is in basic steel today. And the reason that I understand they have got it up for sale is primarily because of the problems that they have with the banks and the need to be able to get money to pay off some of the debts that they have. I cannot see any other reason for doing it. So that ought to be a real indication of how serious the situation is.

A lot of talking went on here this morning in regards to foreign competition. Well, we are not going to elaborate on that but I am sure you realize that that has got to be one of the main reasons why our American steel industry is bleeding so bad today.

But now we find another problem. And that is because the competitiveness locally here has become so strong that now we have got these steel corporations that are eating each other up, trying to stay in business. And it might wind up being a situation where only the strong will survive. And it is pretty apparent that that is one thing that United States Steel is aiming toward. Realizing that they are the biggest producer. And what they are doing with the price war, to my estimation, is certainly going to lead to nothing more but the whole elimination of the industry. Because, as I said, they have had their problems with foreign products, but now they have got their problems with domestic competition here as well. So it is a very, very serious situation.

And do we need the steel industry in America? Well, I am sure you believe, as all of us probably in this room believe, that we do. But what are we doing about it? Well, we obviously need steel for everyday living. And if you were to take, hypothetically, a big magnet and just put it over Youngstown or any other major city and throw the juice on and pick up all the steel in that town, that town would crumble, as you could readily imagine. So that is how important steel is to America in regards to everyday living.

But then more particularly important, where do we stand with steel in regards to national defense? And you could elaborate on this and spend much time explaining that, but I am sure that you can understand the point that I am trying to make. Where would we have been in World War II if we would not have had the kind of steel industry that we have in America, and the kind of steelworkers that did the job in producing the steel that was needed to win that war?

Modernization. Well, it has been indicated here several times that really labor does not have too much of an input in this. About the only thing that we can do is sit down with these corporations and negotiate contracts to the best of our ability that will more or less help these corporations as they move toward modernizing, instrumentation, technological changes, all of the things that are needed and necessary to make us competitive and to stay in business.

And, yes, we have done that considerably well now over the years. As a matter of fact, there is a plant being built in Cleveland today that is referred to as L&S Electrogalvanizing, Inc.. It is a bright spot, it is a joint venture, but it is still a bright spot because something new is going up in steel.

In the 1987 model cars, all the foreign producers especially, are supposed to come out with a 10-year rustproof guarantee. Now our American auto manufacturers obviously realize that the only way they can be in the competition for the 1987 models is to do likewise. So it was some time ago that the higher-ups of J&L, because this was a venture that started with J&L and ultimately wound up now with LTV Steel since the merger, but J&L came to me in regards to giving me the information that this plant was going to go up and then of course asking me to sit down with them and negotiate an appropriate contract. And so that we did. And it is a contract that certainly is going to be a frontrunner, at least we hope.

It is something that is experimental. We are hoping that it works out. It is much beyond what you have heard here this morning in regards to LMPT, the participation team concept. This is really going to be a plant where we have participative management. A lot less management that you have in so many of your other plants, but being very select on the workers that are going to work there in that new plant. And of course the workers that will work in the new plant happen to be laid-off steelworkers from the Cleveland area because that is where the plant is being located. That would be the laid-off steelworkers that we have in the area from former J&L and former Republic Steel.

So we sat down and we have done our utmost to negotiate what the company believes they need to make that particular plant run very efficiently and successfully. And we have made some major changes. And the changes, of course, are in regards to some combination of jobs and extension of jobs of individuals that come into the plant and are very versatile in what they do. And so it is a big venture on our part and we hope that we can arrive at some success on that.

We tried unsuccessfully in the Cleveland area to get a plate mill put up. There was a developer, and you met him, Jim, that was the fellow that I brought to Washington when we had the meeting with the Congressmen and Senators; and this gentleman happens to be a graduate of Case Western Reserve University and is working there as a professor right now. And it was his thesis when he was going through school, and of course he is in his 40's. So he was about one of the oldest students in the class. But he had been an individual that had a kind of versatile kind of life of being an airline pilot with Eastern and so on and so forth and then going to college at that late age. And he and his brother had had some association with steel operations over the years at one time or another. And so they very clearly established in his thesis just what was needed to put up a new plate mill. And we would have a plate mill then, in Cleveland, that would be every bit as good as a plate mill anywhere else in the world. And a plate mill that obviously could compete with any other plate mill in the world. And he was not talking about "coolie" wages, as we like to refer to them in the Steelworkers Union, where they want us to go, where they want us to take our steel workers from an average of about $12 an hour and say, "Well you go down and get your steelworkers to work for about $2.25 and then you can compete." He was talking about a steel mill whereby we would have wages that are comparable to the basic steel wages now. But of course with these management and labor cooperation programs and stuff like that, he felt, and especially with the new technology that they were going to introduce, that definitely this plate mill could be successful.

But where are you going to get the money to put it up? We went from banking institution to banking institution. We went to George Voinovich [Hon. George Voinovich, mayor of Cleveland]; we went to Dick Celeste [Hon. Richard Celeste, Governor of Ohio]; we went to all of these economic development departments. Where do you get the money? It is about a $157 million venture. Nobody wants to touch the steel industry today in America when it comes to handing out some money because they know the position of the American steel industry as it exists today. So you see it has created a tremendous problem for us.

I think there is one other thing I have to say on modernization. And I know that somebody is going to ask me the question, so I might as well touch on the subject. Yes; we have a tremendous strike that is in progress right now with Pittsburgh-Wheeling Steel. Pittsburgh-Wheeling at one time being one of the big eleven and then pulling out in 1982. And the union at that time sitting down with Pittsburgh-Wheeling and getting involved in concession bargaining, and as a matter of fact twice giving concessions in 1982.

Well, let us talk about this company a little bit, because I will tell you right now, Pittsburgh-Wheeling Steel happened to be a first-class operating steel company. A company that certainly can compete, domestically speaking, and very definitely with the foreign producers. They spent money. They spent money they did not have. They managed to get money in which to modernize. And modernize they did, a first-class mill. And yet it is going down. And it is going down because they cannot pay off their bank debts. And that is why they keep coming back to the union to bail them out with concessions.

Well, let me tell you this, all the concessions in the world are not going to save our American steel industry. Believe me when I tell you. The only thing that is going to save the American steel industry today is steel demand. And I think that has been touched on a little bit here this morning by some of the experts. Steel demand, period.

I hate to get up and go to work in the morning any more. The job used to be enjoyable. We could sit down across the table from our counterparts and legitimately and logically negotiate a good contract. Only today it does not happen any longer. You know, it just does not happen any longer. And then we get a phone call some 6 months after we finally complete a contract—yes, a concessionary agreement; I do not know of any other kind of agreement we have negotiated here in the last couple of years or so—and 6 months later get a call from the company and say come back to the collective bargaining table or the plant shuts down.

So we go back to the collective bargaining table. We sit there with our counterparts again. And then we get the sad story that they are in worse shape than they were in when we were sitting down in negotiations 6 months before that.

Believe me when I tell you that I have personally prevailed upon my counterparts in negotiations to give me the bottom line, "Please tell me how far down we have to go in wages and benefits to keep this plant open." Only to be told, "Forget it, Valenta. If your workers would come in here and work for nothing, there is no way we will keep the plant open, there is no business out there. And what business we had, the foreigners have picked it up." Well, the foreigners are eating our lunch today. And I have to tell you right now, we are getting to the point where we really believe that the administration in Washington, DC, today is setting the table for them. We do not know any other way to look at it.

We keep talking here about training and retraining programs. You know, I have been involved in negotiations with basic steel for probably some 20 years now. And I can remember 20 years ago jointly going with some of the top people in the steel corporations to Washington, DC, to lobby, to lobby against those imports. Because in 1960 it was probably at about 4 percent. And then it jumped by leaps and bounds all the way up to where it is today. And, yes, there was a time it was over 30 percent not too long ago. And of course now it is down to about 26 percent and we are supposed to be happy with this? Then we are supposed to take a bottom line of, what, 20 percent as I heard here mentioned this morning? Well let me say to the LTV representative, let us start telling it like it is. Let us start letting these people know how it is, and how serious a situation it is. Quit gilding the lily and bring it out like it is. It is like getting hit over the head with a 2-by-4 and then when the guy quits beating you you say thanks because it feels better. Twenty percent import penetration we can stand? Well, we will not stand that and keep this industry. I will tell you, and it is as pure and simple as that.

And all of these programs, you know, even unemployment compensation and then there was TRA [Trade Readjustment Allowance] and then there was TAA [Trade Adjustment Assistance], and then there is the job training programs. And now we are talking about the Import Stabilization Act. And all of these things that are costing money. When in the hell are we going to take these monies, these Government monies, and invest them in something that is going to benefit this country and the workers in it? And I am talking now about job creation. Job training. The yield on job training is terrible, it stinks. My steelworkers in Cleveland, the Cuyahoga Works plant went down—of United States Steel here—about a year ago. They got put into job training. There was money that we negotiated, the Steelworkers negotiated, in the last contract, that these corporations were obligated to put on the side for retaining. And then all the Government monies for retaining. So our steelworkers went through this program. There was something like a 6-percent yield. A 6-percent yield. Do you know what you are doing? That is insult to injury. To take a steelworker that is out there on the street and tell him, OK, now we are going to put you in a training program so when you complete it you can get a job. Where are you going to get a job? You know, it is as pure and simple as that. You want to flip hamburgers for McDonald's, fine. But our steelworkers do not appreciate this, because they are not getting anything out of it. And there is only one way that we are going to get anywhere in this country and that is going to be through job creation programs. Please believe me when I tell you this.

I think one of the things that saved us in this country here as far as going from a recession to a depression happened to be the Highway Act [Surface Transportation Assistance Act of 1982] that Congress passed. Where tax moneys went into the highway programs. Drive all over this country. That is the only place they are spending money today. Go talk to Celeste and you will find out that the only department that he has got in the State government today that has got any money in which to work with is the Department of Transportation. There are bridges that are being fixed; there are highways that are being mended. And that is the only thing I think that has created any work here, real work you might say, for my kind of people. I am talking about middle class America, the majority of the people, in recent years. The infrastructure of this Nation needs to be built up. And you can go a lot further than highways. And I am not beseeching you to get involved in programs like raking leaves in parks, such as Roosevelt did to try to get this Nation back on its feet. There is all kinds of work that can go on out there that this Nation needs.

Well, I do not know. We have had all kinds of committees that have been formed. And, gentlemen, do not take any offense to what I am going to say, please. I know you are here in a most sincere manner. I know you are trying to get a bead on exactly what is happening in the steel industry and hopefully will have something out of this committee. But there have been so many committees. We talked the subject of the steel industry to death. And I said, I go back 20 years in lobbying in Washington, DC. And within the last 2 years of the Carter administration they developed a tripartite committee. When President Reagan came in, that particular committee was eliminated. If you want volumes on technology and knowing where we stand in this industry, I happened to sit on the original tripartite committee for the Steelworkers Union, and we got into such far-out subjects as clean coke and we were talking about the casters and there is all kinds of technology out there. But it is all kinds of technology that costs. And how do you put it in if you do not have the money? I just told you about that plate mill. Yeah, we would probably be able to compete with the foreigners on that plate mill but where do you get the money in which to build it?

So, you know, I think the volumes of evidence are there. The only thing that we can hope is that we start acting rather than reacting. And it is pretty apparent to me that that is exactly what has been happening in this country now for how many years? But the bottom line again I guess boils down to the fact that as far as the trade deficit is concerned, that ought to very currently tell you where we are today. I am not just talking about steel. Of course we are here to talk about steel, but the same thing is happening in autos; it is happening in textiles; it is happening in electronics. Where are all these industries, where are all these jobs? And now the latest group that is complaining and driving their tractors to Washington, DC, are the farmers. And as far as the farmers are concerned, you might have heard that they have got a new tractor out now that does not have a steering wheel and it does not have a seat. And that is because the farmers in our Nation have been going around in circles and they have lost their ass.

So let me conclude by telling you one thing, all right? We are mad. You know, I cannot tell you in—I cannot shine it up or smooth it off any better than that. I happened to attend an industry conference in basic steel that our union called in Philadelphia last week. There was more than one individual that strolled to the mike. And I will tell you exactly what they said. They said, you know, enough is enough. Now we do not mind taking a beating and fighting back but if it gets to the point that our Government believes that we are going to sit idly by and accept this assault and this abuse, well, then they have got another guess coming.

I am afraid, I am really afraid, that there is going to be a revolt of some kind in this Nation where the workers are going to get together, and especially the organized workers, and they are going to get together and they are going to say,

> Hey, the Solidarity Day I and the Solidarity Day II and the Solidarity Day III did not mean anything. We marched in thousands to Washington, DC; we laid it on the line and there has been no improvement.

I am afraid. I really am. That it is finally going to get to the point where maybe there could conceivably be a shutdown in this Nation. Now I am giving it to you straight. I am giving it to you the way I see it in a practical sense. I think this morning you got a good breakdown in regards to the technical sense of probably what you were looking for here today. Well, I am not a technician. But I am pragmatic. And I am honest. I am telling you here today that it could not be any more serious than it is.

And you have got in the back of the room over here probably about 10 workers, 10 good steelworkers, from Van Huffel Tube Co. And the only thing I am trying to do here is to clear our skirts as far as the union is concerned. Because I will tell you, the old adversarial days are over. I wish I had the time to go into details on this LMPT Program, but I think the representative of LTV pretty well pointed out what they think of the LMPT Program and how well it has worked and the millions of dollars that we save. But here was a case, just for an example, here was a case where the company came to the union and indicated that they were in serious trouble, and it is a tubular product and we know tubular products are in trouble all over the country. And there were about three different types of operations in the plant. And the company indicated that they had intentions of keeping that plant open but they felt that the only thing that they could do would be to sell off one-third of the plant, such as what I explained to you before, what it appears to me LTV Steel is doing with its specialty steel division to try to stay alive, and pay off their debts so there are no foreclosures or there are no lawsuits. So we got involved with the company and we sat down and we negotiated concessions. Not once, twice. The company comes back and says, "Hey, we still have to sell off that one-third." So along came a company by the name of Miami Industries. They came into the area and believe me when I tell you that in a period of about 3 or 4 days, we sat down at the bargaining table and we negotiated a contract with Miami Industries that brought about additional concessions to the Van Huffel employees to the tune of about $5 an hour.

Now, I attended that ratification meeting, because our union does not make unilateral concession agreements. And I personally explained the Miami Industries contract to the members, to these steelworkers that were receiving close to basic steel wages, and told them what the alternative was. Because Miami said we will not buy that portion of the plant if it is going to pay the basic steel wages. And after hours of deliberation, a lot of hooting and hollering, and you can expect that, you would expect it if they were going to cut your pay that much; well, finally, then we took a secret ballot vote and they voted to go ahead and accept this new agreement with Miami. And the company, up until that time, had us convinced that if we would be supportive as a union to sell off that one-third of the plant, they felt they could save the rest of the plant, the rest of the two-thirds of it.

Well, I will tell you what happened. We sold the contract. Miami came in and then Van Huffel proceeded to again want to sell off some more of their plant. At that time they owed their employees 2 years vacation pay where they had not paid them. They owed our Steelworkers Union 2 years of union dues that they collected from the employees and never sent to the international office in Pittsburgh. We did not file a suit because we wanted to keep that plant open and save the jobs. Well, it finally got to the point when we realized they were going to sell off every other thing they had just to clear their own skirts, well then we had to go to court.

Well, it is a shame. You have got people over here that were lied to. And this is happening throughout the steel industry today. Maybe because management is trying to stay alive, I do not know what the situation is. But it is really serious and it is really bad.

Well, they are angry back there. Those steelworkers are angry. And I highlight that to you because I wanted to conclude on the feeling that they are angry all over. And the UAW is becoming angrier. And the pilots went out recently. And all of a sudden the steelworkers were on a picket line with the pilots. And the pilots said, "when you go out we will be on the picket line with you."

And that camaraderie is forming in this Nation. Believe me, that camaraderie is forming in this Nation. And it has finally gotten to the point where we are going to have a slogan in America and that is going to be "An injury to one is an injury to all." And I am no radical. And, Jim, you know that. You have dealt with me for years. I certainly do not—nobody can put me in the category of being a super radical. But I will tell you one thing, I am becoming a fighter. And if that is what is necessary to save this Nation is to be a fighter, then I guess that is what we are going to have to do. And you are the only people that we can rely on. I really seriously believe, in conclusion, that the corporations and the union have done every conceivable thing that they can to try to save this industry. We cannot do any more. We have negotiated, we have done all kinds of things. And it is still in peril. So now it is up to Uncle Sam. And we hope your voices are heard loud and clear in Washington, DC, to help us out from this point on. Thanks very much for the opportunity to address you here today.

[The prepared statement of Mr. Valenta follows:]

TESTIMONY
BEFORE THE SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
OF THE COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
YOUNGSTOWN, OHIO
JULY 22, 1985

The American steel industry is mired down in its worst economic slump. If the present trend continues, the once proud industry will certainly perish. What a tremendous loss this would be to our nation. Steel is not only needed for everyday living, but very importantly for national defense.

It is very apparent that our administrative and legislative branches of our federal government are totally insensitive to the plight of the American steel industry and callously adamant in their position that free trade is a benefit rather than a hurt. Foreign trade as it exists today is both unfair and illegal. Our major trading partners who operate under their own industrial policies have systematically captured a significant percentage of our domestic markets in such industries as steel, textiles, autos and electronics. Some 3 million jobs have been lost in manufacturing since 1979. This is a 20% contraction. Employment in basic steel has dropped from over 400,000 production workers in 1974 to less than 200,000 today.

Realizing the number of bankruptcies that have occurred in basic steel producing companies in recent years and being aware of present and future bankruptcy possibilities supports the theory that if nothing is done the industry will perish. It is no longer a case of industry rationalization shutdowns. It is, however, a case of the industry being incapable of competing with illegal and unfair foreign competition, foreign producers taking advantage of our open market through dumping steel on our shores, plus doing it with either government subsidies or government owned facilities, making competition virtually impossible. The foreign producers are eating our lunch and our government, by not forcing them to play by the same set of rules, is setting the table for them.

Foreign producers, both from developed and developing nations, make steel for export reasons rather than for their own domestic consumption. For example, Belgium and Luxemburg have an annual raw steel capacity of 27 million tons. Home market consumption is 4 million tons. France has an annual raw steel capacity of 32 million tons and they domestically use 22 million tons. Japan, our largest competitor, can produce 157 million tons a year. They use only 85 million tons. Even these major trading partners are concerned about the developing nations such as Korea, Taiwan, Africa, Brazil and others. Brazil recently built a new steel mill for export reasons only. In the world today some 80 nations have steel producing facilities. This is one thing that has caused a 20% world overcapacity. Obviously, these nations believe in order to be ongoing and viable, basic industries such as steel are needed and necessary. They realize that what made America great was the Industrial Revolution. It created jobs and established an economy. They, too, want a piece of the action including ours, and our lending institutions, our government and the multi-nationals who only seek profits at any cost are content to unfairly and illegally give it to them. It is understood and agreed upon that today we have and need a world economy, but only if all nations play by the same set of rules. This is not and has not happened. Our major trading partners have put up impregnable trade barriers and refused to live up to agreed upon international trade rules and regulations. When is our nation going to learn that our steel producers, especially today, would relish the thought of modernizing through either brown field of green field improvements but realize they are financially incapable of doing so. As far as the United Steelworkers of America is concerned, rest assured we understand our members' futures lie in their ability to compete worldwide and that this can only be done through modernization. As a matter of fact, all of organized labor feels this way. Labor's view pertaining to modernization is quite simple. The United Steelworkers of America has never opposed modernization, even though we realize some jobs may be lost in the process. We always supported modernization in the steel industry and understand completely the need to do so. If more modernization had taken place in the last decade, the steel industry would today be more competitive and in better condition as a result of modernizing. In fact, a portion of the concessions given by the members was earmarked for modernization purposes.

On the question of "coping" with employment dislocation that occurs as a result of modernization, no simple answer or comment can be given to this complex subject. To understand the injury which is currently being inflicted upon our members, one must look beyond the unemployment statistics to learn what is actually happening in the lives of our members and their families. Our members are accustomed to the ups and downs of the steel business as well as the layoffs and recalls that accompany them. They quickly realized that the combination of modernization and gradually increasing imports were reducing the total number of available jobs. In our opinion, however, the principle cause of injury is "imported steel."

A study done in 1983 about laid off members at the Duquense Works in Duquense, Pennsylvania revealed many sad stories; a portion of that study concluded that:

- Only 38% found full time jobs
- Only 19% found part time work
- 83% described earnings as decreased "significantly"
- 31% of the spouses had some type of job or unspecified sources of income
- Company paid insurances had ended for 65% of the families
- 20% of the insurance being covered by spouses' policies or outside health insurance
- 58% had children living at home and were homeowners -- many had changed residence due to inability to meet mortgage payments, utility payments and taxes

The study concluded that 80% of these displaced steelworkers are suffering psychologically related distress.

Studies such as these show clearly the devastation that occurs whenever or wherever workers are dislocated. The way to "cope" with dislocation is to provide another job. However, the steelworkers have several unique problems in this area. The economics of their communities are frequently built around the steel industry. The supporting or steel consuming industries related to the mills and the service industries are likewise affected causing an additional loss of jobs. Also, since the steel mill offered workers a decent standard of living, other employers assume they will accept recall, if offered, and are against hiring them for that reason.

On the question of efforts being made to retrain steelworkers whose prospects for returning to the industry are dim, let me say that the Department of Labor a few years ago published a forecast listing those occupations of greatest growth in terms of total jobs for 1978 through 1990. The eight largest occupations of the future are not what one would call highly skilled, with one exception -- professional nurses. The rest include janitors, orderlies, sales clerks, cashiers, waiters and waitresses, office clerks and fast food workers. If we allow our industrial base to continue to decline, these will be the low paying jobs of the future -- jobs that decrease the standard of living for middle class and poor American workers and jobs that obviously will not provide much needed tax revenue. Without an industrial base, and steel is the key to our country's industrial base, the nation cannot provide millions of workers decent jobs at decent pay. Even in Massachusetts and other sites of high tech growth, displaced industrial workers are five times more likely to end up working in fast food restaurants than in "high tech" manufacturing jobs.

The Import Stabilization Act of 1984 provides that one percent of the industry's net cash flow is to be devoted to the purpose of retraining steelworkers whose prospects for returning to the industry are dim. It would be difficult to give much testimony in this matter since the Act has not yet been in effect one full year and the results are not yet in. However, it is hoped that the monies will and are being used for what they were intended - displaced workers - and not for upgrading workers currently holding jobs in the industry. The company should bear the cost of upgrading employees in the usual manner, not with monies delegated for the retraining of displaced workers.

There are those who would have the federal government abandon the steel industry. They loudly claim that the days of the smokestack industries of the United States are over and that we should move to "high tech" industries which would not have to compete with low cost labor from abroad. There is no hiding place in high tech, which employs fewer than 5% of manufacturing workers, and even if it grew at geometric rates, it still could not meet the employment need of our economy. Furthermore, so called high tech is not immune to the problems of the rest of the industrial sector. Where is Atari and those 1600 jobs it exported to the Far East? Technology is certainly an important aspect as we fight for survival in our interdependent world, but technology offers no safe haven.

Voluntary restraints do not work. The nations that offend us the most could neither gripe nor complain, and obviously be incapable of prosecuting if mandatory controls were imposed upon them. "They have had their hand in the cookie jar once too often and at least a slap is called for." If you refuse to listen, then you have to feel. If ever protectionism was necessary it is now or never. By the end of 1985 we might not have anything left to protect.

Both the American steel industry and the United Steelworkers of America have been heavily accused of being responsible for the industry's present crisis. Nothing could be further from the truth. What I have said so far proves that the blame lies elsewhere and that finger pointing will not solve the serious problem. The steel companies are accused of not modernizing and while it is partially true, modernization can only come about through profits. Profits cannot be made when the industry operates at less than approximately 75%. Steel is a highly capital intensified industry, and obviously this is the reason why foreign producers rely on the help of their governments. I know for a fact that for several decades management and labor within the American steel industry have been doing every conceivable thing they could to salvage the industry. Many innovative provisions have been added to the coordinated bargaining agreements. The Labor-Management Participation Team (LMPT) concept has proven successful, to say the least. However, in this regard, what do we do for an encore? It is extremely discouraging when, for example, at a given plant both parties work well together and have exemplary relations, yet the plant faces emminent shutdown -- not just discouraging, but immoral when you consider the trauma, hardships and resultant cruelty imposed upon the employees and their families, and yet the beat goes on.

I am incensed at the accusations that steelworkers are overpaid and responsible for the industry's failures. Quite the contrary. Our man hours per ton, with less than adequate tool and equipment, are the best in the world. As to negotiations, we have tried in vein to provide job security and moderate improvements. Being on a wage thread mill in the 60's, we had no other alternative but to renogotiate a cost of living clause. Today $5.00 of the close to average $12.00 per hour earnings comes from C.O.L.A. If finger pointing is necessary, point it at Washington, D.C. This is an appropriate note to conclude on.

My job affords me the opportunity and the privilege to be close to my members which are devastatingly less in numbers. Our Union had 1,200,000 members in 1981. We are at less than 700,000 today. My District, which takes in all of Northeastern Ohio, had 47,400 members in 1981. Today we are at less than 27,000. Obviously, more than unfair and illegal imports caused this. A self inflicted recession certainly helped. In addition to being close to steelworkers, I likewise have associated with all other unions through AFL-CIO affairs and community activities. It is apparent to me that the insecurity of our American workers, plus the lack of hope for their futures, is creating a build-up that could explode in the near future. Comments such as "Let's stand up and fight" or "Let's take matters in our own hands" are echoing around the nation. It is apparent to me that our federal government's deaf ears and lack of concern could trigger a revolt. After all, it is one thing to take a beating, but to take it lying down is not only bad, but very un-American. Unabated frustration and uncalled for suffering brings about an inability to rationalize. American workers have their rights in our free and Democratic society. All they ask for is the right to exercise them. This means a decent job which fosters dignity and respect. The only thing that makes America work is a working America.

Respectfully submitted,

Frank J. Valenta

Frank J. Valenta
Director, District 28

Mr. **Traficant**. I would like to just thank both of you for opening statements. And I think the emotion of your statement, Frank, Mr. Valenta, and the types of subject matter that you relayed here today are what is really at the core of the problem in this country.

I think the tragedy is that that has been stated, felt, and emoted for a long time. That it has relatively fallen upon a passive ear in Washington.

I would just like to say to you that there is no question that you are mad. And maybe it is about time that you are.

I am going to defer now to Mr. Volkmer and any questions he might have insofar as—they do have a flight schedule to reach and they will have to leave here by about 3:25. So if we can, we can move our program along and keep your answers perhaps in line with their tight schedule.

Mr. Volkmer.

Mr. **Volkmer**. Yes. And if possible, if we can finish up a little beforehand and Mr. "Robins [Dr. Roblin]" is still here, I would like to have him brought back and ask a couple questions.

Mr. **Traficant**. Absolutely, Mr. Chairman.

Mr. **Volkmer**. I will try and be brief. Mr. French, I notice in your testimony you mention some programs within the SBA, Small Business Administration. Have those been helpful in providing for new—

Mr. **French**. The SBA 503 Program has particularly been helpful. And this is one that has been up before the administration and through the current budget bill. I am not sure if that—

Mr. **Volkmer**. We are still OK so far.

Mr. **French**. Still talking about that. But of all the programs in the history of SBA, which does not have a good name historically, the 503 Program was developed and identified to be with successful types of businesses and industries and ventures. And as it applies here in the Valley, the two groups, ourselves and one other in Warren, that operate those two companies, we have seen successes. Identification with good companies, not with losing ventures. It is a good program.

Mr. **Volkmer**. Have you all utilized here any UDAG [Urban Development Action Grant] grants?

Mr. **French**. To a limited extent. There is currently several projects that are talking about UDAG. A new hotel and there is even one right now with a brewery that means a lot to the community. Not so much with job creation—it is limited on job creation—but the impact and the vision and the self-image that is needed. The UDAG has been active and it needs to be more active in the community.

Mr. **Volkmer**. OK. Mr. Valenta, I can understand, what I would say, a lot of your frustration, as I am sure it is directed toward Washington with the imports. Some of us who are not only involved just in steel, and in steel not to the extent that you are, but in other areas. I, for one, come from a strong agricultural district and I could talk about that. And I also have textile plants in my district and I can talk about those closing. And they have closed. They still have a few left. And I can also talk about footwear, where 70 percent of that is coming into the United States and I have a couple plants left. But I have had more close than I have left. And I have two tube and pipe plants in my district also, by the way, and both are Steelworkers Union. So I do have, and as I said before, you heard me talk about my refractories. I lost two of those plants since 1980. And the remaining five are all running at about one-third of capacity.

Some of us use an expression in Washington that instead of just free trade we feel that if we are going to have free trade we should have a level playing field to begin with. What we mean by a level playing field is that every country, every place, plays the same way. And if other countries are going to subsidize their, whatever it is, industry, then that subsidy should be taken into a tariff or whatever you have to equalize it when it comes into this country. So we are trying to push the idea of having a level playing field for everybody. And then let true competition take place. We do not have that today, would you agree with that?

Mr. VALENTA. Absolutely, 100 percent.

Mr. VOLKMER. And I agree that some of us feel that 30 percent, 26 percent, 20 percent of imports at this time are too much. And we will have to try and keep pressures on to try and hold it down as much as possible and hope that we can see some recovery within competitiveness. And that is part of the purpose of these hearings, to try and encourage further research and hopefully with that research we can make our industry, in the steel industry, more competitive. Just like we can do in other things the same way. It seems to have helped some in the automobile industry with the quotas on the Japanese. And I, for one, to be honest with you, would like to see those quotas remain. And I make no bones about it. Because again, I do not think we have a level playing field there.

So I have made my little speech. I want to personally thank you and the rest of the witnesses that have been here. It has been very helpful to us.

In retraining, there is no question in mind though that if we are to be competitive as modernization takes place within the steel industry, present employees are going to be faced with a new challenge, they are going to have to be retrained, do you agree with that?

Mr. VALENTA. Yes. But I think that falls within the purview of the corporations themselves in that kind of training, that kind of upgrading. I think if the corporations wound up in a profit picture, that all of these problems that they have would very quickly disappear, to the extent that they could do their own training and the likes of that. It is going on right now as far as this new mill that I made reference to that LTV is putting up in Cleveland—the mill is not going to open up until probably, we hope, about April or May of next year—where they can start supplying electrogalvanized steel to the auto manufacturers—by the time for the 1987 models. But here is LTV Steel bringing their employees in already, in August, the first of August they will come aboard, and they will be in the plants in training. And by the way, I did not give you the full name. It is called L&S Electrogalvanizing. But that stands for LTV and Sumitomo. And so it is also going to be a situation where these employees are then going to be taken to Japan, because that is where they happen to have an electrogalvanizing mill there. So I think the company should do their own training. I mean the training that I made reference to are the dislocated steelworkers that go to school and wind up working in a hamburger joint, you know, those are the programs that I think just really are not doing us any good today.

Mr. VOLKMER. OK, thank you.

Mr. TRAFICANT. Mr. Packard.

Mr. PACKARD. Thank you very much, Mr. Chairman.

Mr. French, what percent of the Mahoning Valley economic and employment base is related to steel. Do you have any idea?

Mr. FRENCH. I do not have the figures in front of me. We traditionally were practically solely dependent on steel and all the groups that service steel. There is a lot of figures that are bandied around at the loss, as we had major companies here that no longer produce or are active in the area. And the suppliers that further went along with that. We still have a good base with the LTV and Warren Works and to a lesser extent, still in Youngstown. But the numbers are probably, and Mr. Valenta can probably give you better numbers than I could tell you, but probably one-third of what they were at one time.

Mr. VALENTA. Oh, easily that. Definitely. Well let me give you an example of the district here in numbers. District 28, which is almost all of northeastern Ohio, in 1981 had 47,400 members. And today we are down to 26,000. And the district that I had just described to you is predominately known as a basic steel district. We had formerly J&L and Republic, and now LTV, and United States Steel all in this area. So that will just prove to you the devastation and the loss of jobs.

Mr. PACKARD. Again, Mr. French, what do you think that the community can do to help revitalize the steel industry here? Recognizing that you are diversifying in other areas with your economic development programs. But specifically to the steel industry, how can you best assist there?

Mr. FRENCH. Well, I think I mentioned in the written comments that creating a condition that would help make investments more conducive. I think ties with universities. For instance, this university—Youngstown State University—while it is a very nice and modern campus, is not known as a research university. I think if, for instance, the high-technology computer center that is currently being built, ties between that and the steel companies to help implement technology that could be used, I think, would give an incentive to steel producers and other companies like that to make investments and cluster closely. We are not trying to intimate that we could be a Silicon Valley, but specific developments of technology relating to our strong points, have to be our only asset.

Mr. PACKARD. Are there efforts being made to bring research and development qualities to your local universities?

Mr. FRENCH. I would say there is some limited efforts right now. The State of Ohio is making some inroads along with the university. But this would be a decision of the board of regents for the university and for the State of Ohio. And public universities would have to make a formal—

Mr. PACKARD. The LeGrande report indicates that it would be unlikely that current steel workers will be able to be retrained to work again in modernized steel facilities. Do you agree with that?

And if so, is MVEDC doing or able to do anything in terms of helping in the retraining?

Mr. FRENCH. Most of our—first of all, I do agree. It is unlikely for a person, not because of his own inclination, that worked in a condition for 20 years and was very successful and did a good job, to ask that person now to step into an electronic data processing operation, which he has no exposure to, and maybe learn that over ten weeks. It is pretty hard. I do not think any of us could do that.

On the other hand, the applications where we do see the people that have marketable skills, especially when you talk about machinists and people who had good types of skills, are able to make some transitions over. The problems come in, as Mr. Valenta said—for instance a tube mill that might be closing. Our corporation will see some of the residuals. Where maybe some more innovative portions of former management will get together and try to salvage the more profitable portions of a small mill. And we will work with them and try to do some financing to keep a portion of it going. Hopefully, they will be able to make some innovations as they go along. But taking a person who, today, has had 20 years and has not had the opportunity of training by his company or himself, it is very difficult to find equal employment. It is just impossible.

Mr. PACKARD. Mr. Valenta, do you agree with the report that likely most of the steelworkers that—current workers would not be able or qualified to work in modernized plants?

Mr. VALENTA. Well, I think you have to break the workers down to the extent that you have production workers and then you have maintenance workers. That could be the case. And a considerable portion of the so-called production workers that wind up in the category of being low skilled or semiskilled operators of equipment and that. But if you are talking about getting into some high-technology operations and so on and so forth, well, that is what they are doing now with that L&S plant in Cleveland. They are relying on the maintenance people that they had in the mill that were laid off. For an example, if you are an electrician or a motor inspector or something like that where you have dealt with electricity, well, with a little bit of schooling you have got that background anyhow. And so it is just a matter then of being retrained and being capable of moving up.

Mr. PACKARD. What can the unions do to assist in that retraining process? Or what are they doing?

Mr. VALENTA. Well, as far as the unions are concerned, I guess it is our support of these programs that, No. 1, helps the program. And I do not know what more we could actually do. We try to negotiate certain provisions in the contract that allow these workers to get the schooling in addition to that. That set up programs where you get a real diversification in the people that are doing these jobs and the number of jobs that they can do. And so that is about the extent of it.

Mr. PACKARD. What programs do you think would be most effective for the Government to get involved in in retraining? Or would you suggest that the money be used for other purposes that might help the steel industry?

Mr. VALENTA. No, I think—yes, I think some of the corporations have taken advantage of some State monies and so on, even like in putting up the caster. And that was when Republic had that operation in Cleveland. I know the State—Celeste came down and gave them a good sized check for their involvement in retraining. So to that extent, yes. I think those monies spent on retraining are monies that are going to be plowed right back into the economy. Because you are taking somebody and upgrading that skill and allowing them again to be a good productive worker. And so that would be money well spent in that kind of training.

Mr. PACKARD. What generally is the attitude of the unions on the steel initiative? Do you believe that the money, and we are talking over a 15-year period of anywhere from a million to a billion, do you think that that money could be better used for capital improvement and for modernization; or do you think it is better used in the research/development area?

Mr. VALENTA. I think it would be better used for improvements for modernization and job creating situations. I certainly do. I know the emphasis has been in the other direction. But I do not see where we are getting anywhere.

Mr. PACKARD. I think I will quit there, recognizing, again, the shortness of the time. Thank you very much.

Mr. TRAFICANT. Mr. Volkmer, you had another question you wanted to ask?

Mr. VOLKMER. Mr. French, I notice in your testimony here you talk about being able to save the economic development of the rail corporation, or its being able to save this 2.75 miles of industrial railroads servicing these several companies. Where did the financing for that come from?

Mr. FRENCH. It was a partnership between the Federal Railway Administration, the Ohio Department of Transportation, Mahoning County Commissioners and then donations from private companies.

Mr. VOLKMER. Is it presently operating at least at, not necessarily a profit, but it is not losing money?

Mr. FRENCH. In the first 6 months of operation it is right about where we thought it would be. Which is a break-even status. It was not intended to be a profit making—

Mr. VOLKMER. I know, but it is a break even?

Mr. FRENCH. Right.

Mr. VOLKMER. Thank you.

Mr. TRAFICANT. A few questions that I have. Frank, in some of the testimony that you have had, this decision made by U.S. Bankruptcy Court Judge Warren Bentz to abrogate the labor contract down there, Wheeling-Pittsburgh, what ramifications will that have on the tenor and the mood of the steelworker in America and what might be the future ramifications of that decision as it relates to the work place and the steel industry?

Mr. VALENTA. Well, I made reference already to the industry conference that was held in Philadelphia last week. And the participants in that conference happened to be local union officers. All local unions within the basic steel industry. As a matter of fact, it was most appropriate that that meeting had been scheduled. Because that was just when the decision came out, just shortly before that, from Bentz to go ahead and abrogate the agreement and allow Pittsburgh-Wheeling to set up their own contract. And was not it ironic that at the same hour that the judge ruled, that an already printed contract, and I am not talking about mimeographed, I am talking about a contract with hard cover that had come back from the printer, was ready to be distributed. So while the mood of that meeting was really something, you had to be there to understand it. And, yes, the steelworkers were exceptionally angry. And that is when one after the other strode to the mike and indicated that we are not going to stand for this. If the companies want to sit down and negotiate with us—which really Pittsburgh-Wheeling should have done, rather than go into bankruptcy where it is costing them $1 to $2 million a week with professional people handling that bankruptcy judgment. And they did not do it.

Well, I think I pointed out, Jim, that the feeling seemed to be at that conference that an injury to one is an injury to all. And I heard steelworkers say, "If you have got any problems on that picket line, well then you just let us know because we will come from all over the country."

I think there is a showdown. I really do. I think there is a showdown at Pittsburgh-Wheeling Steel. And it is a sad situation. And I do not like the scenario any more than anybody else, really. But I guess it is when you are finally cornered and you do not have any place else to go, you are going to come out fighting. And there was a lot of camaraderie that I saw at that meeting. And I just hope that it does not turn into a full-fledged revolt. That is all I can say.

Mr. Traficant. A couple other areas, Frank, as briefly as we could with the time we have got, with the time constraints that we have. The new tax plan and the reforms that were discussed and perhaps removal of the investment tax credits and the accelerated depreciation schedules; what type of ramifications can you foresee as far as that being applied to industry and what effect will it practically have on the work place and jobs?

Mr. Valenta. Well, our international union strongly supported that measure when it was introduced, basically because we thought it would encourage the corporations to invest more monies and to maybe think more in terms of instrumentation and technological changes and modernization and all of that. I think it did to a certain extent. If it is taken away now, I think it is just going to be more discouraging to a lot of corporations that were thinking in terms of trying to utilize that to do something within their businesses. My opinion would be that I think it could greatly hurt our economy in the long run, based on what improvements some people were thinking in terms of making, some corporate heads.

Mr. Traficant. In another area then for Mr. French, I read through some of your testimony there and it talked about what you have talked about here. An area such as the Mahoning Valley, you talk about enterprise zones. Could not we create almost half of the available land into an enterprise zone and would it make much of an appreciable difference at this time with the conditions that exist in the administration and Washington relative to trade and other problems that are affecting industry?

Mr. French. That enterprise zone concept has been kicking around for years now and the States have taken more of an initiative than the Federal Government has to implement it. You can put all kinds of incentives there but the type of strings that were placed on the enterprise zones, of where they had to be placed in order to get maximum benefit, really have presented a lot of problems. You cannot take a battlefield or a wasteland and say this is where your new development is. You can only force so much of the arena that you are going to do your development in. I think it is a good idea. But the practicality in having any short-term immediate benefits is going to be a problem.

Mr. TRAFICANT. Along with that, and perhaps maybe in a different vein, one of the problems you have in an area of high unemployment, which you have alluded to—and I am going to make available to the committee the study here at Youngstown State University which shows the unemployment rate of about 18 months ago at 29.3 percent. Five percentage points higher than the Great Depression statistics. And I will have that to the committee and I would like to have it made and have unanimous consent here to have it placed in the committee records.

[The material referred to follows:]

ASSESSING THE ACCURACY OF BLS LOCAL UNEMPLOYMENT RATES:

A CASE STUDY

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EXECUTIVE SUMMARY

In June 1984, the Center for Urban Studies at Youngstown State University conducted a personal interview survey of 3,983 adults in the Youngstown/Warren area. The study replicated the methodology used by the U.S. Bureau of the Census in its Current Population Survey conducted monthly at the national level. The survey is one of the few of this magnitude ever conducted at the local level.

The unemployment rate computed from the local survey was found to be 16.5 percent. This rate was higher than previous indirect estimates--10.7 percent--of the unemployment published for the area by the U.S. Bureau of Labor Statistics.

Unemployment in the Youngstown/Warren area was not evenly distributed among major groups in the labor force. Highlights of the findings are presented below.

- Younger people were hardest hit. Some 31.2 percent of those 16 to 19 years old were unemployed, and 22.3 percent 20 to 24 years old were unemployed.
- Blacks (37.2%) were much more likely to be unemployed than whites (15.0%).
- Young blacks, aged 34 or less had the highest unemployment rate of any group: 48.6 percent.
- Males (15.6%) and females (17.7%) were equally affected by unemployment in the area.

- Black females had a large unemployment rate: 40.6 percent, as compared to white females (15.8%).
- School dropouts were three times more likely to be unemployed (25%) than college graduates (8%).
- Nearly 2 unemployed people in 5 were out of work for at least one year. The average unemployed person has been jobless for at least 40 weeks on average.
- About one-fourth of the unemployed came from families with incomes of less than $5,000.00.
- Discouraged workers--those who have given up looking for a job--were likely to be high school dropouts, female, and black.

Results of the study revealed that in this area minority status, lack of education, and youth, especially taken in combination, were very likely to lead to extended unemployment, either through the loss of a job or in failing to obtain initial employment.

COUNTING INVISIBLE PEOPLE:

A Proposal to Study Discouraged Workers and U.I. Exhaustees

Submitted to:

Division of Labor Market Information

Ohio Bureau of Employment Services

145 S. Front Street

Columbus, Ohio 43216

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Introduction

Labor market research, by chance or design, has ignored two groups of workers in studying unemployment: (1) the discouraged worker--those who have given up looking for work but who want a job, and (2) the Unemployment Insurance (UI) benefit exhaustee. Both groups are important in delivering training or retraining programs, offering employment services, and extending other health and human services (e.g., health care, public assistance, etc.), and are the most difficult to reach and perhaps are most in need. In spite of their importance as target groups for public policy interventions, little is known about them and their relationship to unemployment roles, especially at the local level.

In the sections below, problems in understanding discouraged workers and U.I. exhaustees are reviewed. This is followed by an overview of a proposed research design to be used to answer questions about the two target groups. Finally, a budget and the time horizons for the project are offered.

The Discouraged Worker

Discouraged workers are persons who would like to work, but have given up looking for a job, either because they believe jobs are unavailable[1] or because they believe they are unqualified for prospective work.[2]

Discouraged workers are problematic from a public policy perspective because very little is known about them, how to count them, and their relationship to unemployment generally. In a recent report by the National Commission on Employment and Unemployment Statistics,[3] policy analysts pointed out that five basic questions about discouraged workers remain unanswered:

1. How many discouraged workers are there?
2. To what extent are discouraged workers similar to the unemployed in socio-economic background, previous employment experience, desire for regular employment, skill and education level, and personal hardship associated with not working?
3. What are the health and human service needs of these workers? And how well are existing community programs serving these needs?

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[1] This includes those who have looked for but not found jobs, as well as those who have not looked.

[2] This includes those who lack training or skills, believe they are too old or too young, or have a personal handicap.

[3] T. Aldrich Finegan, The Measurement, Behavior, and Classification of Discouraged Workers, Washington, D.C., June 1978.

4. What sort of public policies would be required to increase employment or employment opportunities among discouraged workers?
5. What are the policy implications of including discouraged workers in official unemployment rate calculations?

Understanding and counting discouraged workers is an important public policy issue. First, at least one-fourth to one-half of those who are jobless in a community may be discouraged workers who are not included in federal unemployment rates. Second, because this group has essentially dropped out of work life in society, they are very likely to be underserved by many social programs. Third, they are probably poor, and without resources: this being the case, they are very likely to be helpless in the face of joblessness. The situation is exacerbated by the fact that some of these workers might have once been productive members of society, while others are still awaiting their first employment opportunity.

In spite of the importance of discouraged workers to local and state labor markets, the U.S. Bureau of Labor Statistics, which gathers labor force information, has done little analysis for states or areas. BLS provides national estimates on the number of discouraged workers, as measured quarterly through the Current Population Survey. While limited data for large states are available from this survey, little is known about the needs of discouraged workers from the local perspective.

With the lack of information about discouraged workers, policy-makers at all levels of government are unable to understand the "true" level of joblessness or economic hardship in communities. Without this understanding, it has been difficult to develop programs and marshal funding sufficient to meet the needs of discouraged workers.

The U.I. Exhaustee

The portion of the unemployment rate calculation, based on actual tabulations of persons receiving Unemployment Insurance (UI), is very accurate. Administrative records exist which can be verified and counted for each unemployed person. The rate for other unemployed persons, including those who have exhausted UI benefits and remain unemployed for extended periods, are much less accurate. Those exhausting benefits must be indirectly estimated from administrative data, but cannot be directly counted.

Estimates of those exhausting U.I. are used by the U.S. Bureau of Labor Statistics (BLS) Handbook Method in calculating local unemployment rates. In incorporating these estimation techniques, BLS appears to make the following kinds of assumptions:

1. that all local areas have the same ratios between active and inactive claimants,
2. that the ratios vary or change in predictable, inevitable ways, and
3. that the number of exhaustees under- or over-estimated does not substantially affect overall employment rates for local areas.

The national Current Population Survey (CPS), conducted by the U.S. Bureau of the Census in order to calculate a national and state unemployment rate, further clouds issues concerning indirect estimates of the unemployed not under

UI. The CPS, although a personal survey of all groups in the labor force, does not ask respondents about the reception and exhaustion of UI benefits. When the individual community Handbook calculations are adjusted at the state level, using the state CPS, it appears likely that indirect estimations of the unemployed U.I. exhaustees may become further distorted.

At present, then, unemployment rate calculations are only as good as their weakest link: in this case, indirect estimates of the unemployed. Unfortunately, there may be reason to believe that these rates are inaccurate because of the problems in incorporating indirect data sources.

Estimating the number of workers who have exhausted benefits is only one concern. The other involves the fact that so little is known about jobless workers who may have exhausted UI benefits. Specifically, the following questions have yet to be answered:

1. Does the availability of UI cause workers to postpone searching for jobs in order to collect benefits without working?
2. Once benefits are exhausted, under what conditions are workers likely to continue to use the Ohio Bureau of Employment Services (OBES)? How do workers feel about the effectiveness of OBES? What programs or services might encourage workers to use OBES? Are they aware of training and other services available through the Employment Service and the Job Training Partnership program?
3. Given worker demographics and occupations, what sorts of people are likely to exhaust UI benefits without obtaining further employment?
4. How long do people stay unemployed following the exhaustion of their UI benefits?

Research Design

Research described in this section is divided into two parts. The first concerns a proposal to conduct a local CPS survey. The second involves an analysis of the data required for BLS on its national CPS.

Local CPS

Because past labor market research has relied heavily on the U.S. Bureau of Labor Statistics' (BLS), Current Population Survey (CPS), we are proposing to use CPS concepts and methods where possible. This will allow for a direct comparison of local results to those available for the state and nation.

The Center for Urban Studies proposes to identify discouraged workers and UC exhaustees through household contacts in the Youngstown/Warren/East Liverpool area (comprising Mahoning, Trumbull, and Columbiana Counties in Ohio).

The CPS questionnaire will be used as a basis for contacting 3,550 households by telephone. Because any adult may respond for all other members of the household, some 7,800 completed questionnaires should be produced. Of these completed interviews, approximately 950 should be classifiable as either discouraged or U.I. exhaustees. Once the target groups-discouraged workers and U.I. exhaustees-have been identified, interviewers will make appointments with individuals to engage them in a personal interview. The personal interview format will allow researchers to obtain elaborate work history and attitudinal data.

Approximately 50 interviewers will be required to complete the project. In cooperation with the regional office of OBES, unemployed workers, with the skills necessary to participate in the project, will be hired. This will allow researchers not only to gather required information, but in the process channel funding to those in need in the region.

It should be observed that in the process of identifying the target groups under study, a by-product of the research will be a complete local CPS. This will allow researchers to compare local unemployment rates with those prepared by the state, using the BLS Handbook Method. Because unemployment rates were higher for the area in our previous study (See Division of Labor Market Information, OBES, "Estimating True Unemployment Rates for the Youngstown/Warren Area," August 1984), this will assist in the further evaluation of potential biases in BLS unemployment counting for Ohio cities.

National CPS

The Center for Urban Studies has acquired the national CPS data set for January 1984. The data set contains approximately 162,000 cases. At present, data from these stuides concerning discouraged workers is not reported at the state-level. National data are published quarterly.

The Center for Urban Studies proposes to analyze the national CPS in order to understand the "discouraged worker" problem. Findings will concern a comparison of the nation, the midwest, and Ohio. Data from the local CPS described above will be included, as well. To our knowledge, research of this kind has never been published. It should make an important contribution to public policy formation underway at the state and local levels.

Project Administration

The project will be undertaken by the Center for Urban Studies at Youngstown State University. The Center, established in 1969, employs fifteen full- and part-time professionals. The Center is funded partially through University monies and by means of grants and contracts from agencies at the local, state, and federal levels, including: Ohio Bureau of Employment Services, National Science Foundation, National Institute of Mental Health, Urban Institute, Ohio Board of Regents, Ohio Department of Education, Ohio Corrections Department, Ohio Department of Mental Health, and over 75 other agencies.

The Center is a public service research institution with a national reputation for the study of distressed communities. The Center has conducted over a hundred survey research projects in the last five years. Many of these projects have culminated in books, monographs, and articles which have received much acclaim. The Center's best-known products are two books* and a host of articles concerning the steel mill closings in Youngstown in 1977. This study, similar in method and scope to that in this proposal, has been used as a basis for public policy-making and debate on a national level.

The staff at the Center is well-qualified to undertake the study. Copies of resumes from key staff members are attached.

*Terry F. Buss and F. Stevens Redburn. Shutdown at Youngstown: Public Policies for Distressed Communities (SUNY, 1983).

Terry F. Buss and F. Stevens Redburn. Mass Unemployment: Plant Closings and Community Mental Health (Sage, 1983).

Budget Explanation

Personnel	
a. researchers (a)	$ 8,300
b. interviewers (b)	$35,000
(1) telephone	(10,000)
(2) personal	(25,000)
c. clerical (c)	$ 2,000
Operating	
a. supplies	$ 500
b. travel (d)	$ 1,000
c. telephone (e)	$ 400
d. postage (f)	$ 800
e. publication (g)	$ 200
f. miscellaneous	$ 300
Subtotal (Direct Costs)	$48,500
Indirect costs (15% of Direct)	$ 7,275
Total	$55,775

Budget Explanation

(a) Refers to compensation for professional staff.

(b) Interviewing costs include telephone and personal interviewers.

(c) Refers to student assistance.

(d) Some personal interviewers will be compensated because of long travel distances between interviews. This is especially the case in rural areas.

(e) Refers to charges for local calls made by telephone interviewers.

(f) Letters will be sent to potential respondents informing them about the project.

(g) Refers to photocopying final report.

Time Horizons

	Months							
Local CPS	1	2	3	4	5	6	7	8
1. design	XXXXXXXXX							
2. inteview selection and training		XXXXX						
3. conduct interviews			XXXXXXXXXXX					
4. data processing				XXXXXXXXXX				
5. report preparation					XXXXXXXXXXXXXX			
National CPS								
1. data analysis	XXXXXXXXX							
2. preliminary report		XXXXXXXXXXXX						
3. final report (combine with local CPS above)					XXXXXXXXXXXXX			

Mr. **Traficant**. But as to this question as far as economic development is concerned, we are getting too many groups and these groups are going in all different directions sometimes. And that is the rap that is coming from many people that sit on their skirts and analyze the cohesiveness of a community to dig itself back from underneath the problem.

What, if any, response do you have to that criticism that has been leveled that too many economic development groups have fought for turf and they have not worked together and streamlined their efforts to maximize economic development in this particular region?

Mr. **French**. I would say this is incumbent upon the community and the community leaders. There is only so many resources available in the community and if there are any duplication—I think there may be a few areas—but a lot of times we who work in economic development feel that there is a lot of bum raps as far as duplication. A lot of people that work in this every day have their own areas of expertise. And what happens is, people get confused in what they call alphabet soup of all the different groups. But I think if you boil it down to the bottom line, while there may be some competition at certain levels, the majority of it is a complementary type program and maybe an education of the public in general would help relieve some of that feeling that there has been an over amount of duplication.

Mr. **Traficant**. Well, I just want to thank this particular section of the panel. And, Frank, do you have a closing statement you would like to make?

Mr. **Valenta**. No; I just would like to make one point here that I think is important, Mr. Chairman. And that is this, you are talking about the exceptionally high level of unemployment in this area, and of course you are holding your hearing here and I imagine it was for that specific reason. But this was more or less known as a steel town. And of course up until now we have been talking about steelworkers. But a rule of thumb in steel operations happens to be, wherever you have got a mill and you have got one steelworker, there are three other workers connected with that mill in support industries. You have got your truck drivers; you have got your building tradesmen; you have got all kinds of service-connected jobs to that mill. So when you lose a mill and you lose a town, like we have lost here, you have lost all of those other jobs that were connected with that industry as well. And I think that is a pertinent point that has to be made.

Mr. **Traficant**. The only other thing I would just say maybe in closing, for the record since it was mentioned here, is that particular mill that you discussed in the Cleveland area that has reached some difficulties and some impasse, we have, and are available and have looked into that, met with those individuals. But I have to agree with you 100 percent in the testimony that you have brought forward here today. The problem is that you can see the frustration setting in. Something is going to have to be done and I believe that the corporations and labor have taken about all the stands that they can possibly take. So hopefully the information that has been disseminated here today can be brought into some focus. And I have the type of confidence that can be done.

Mr. VOLKMER. Yes; I would like to ask Mr. Valenta, it appears to me from your testimony that the steelworkers, and I assume this is nationally, are willing to assist and work with industry in developing and implementing new technologies, is that correct?

Mr. VALENTA. Oh, 100 percent. I mean labor's position on new technology is that without it we do not survive.

Mr. VOLKMER. All right. Do you feel that you have been or are sufficiently involved in the modernization effort?

Mr. VALENTA. No; definitely not.

Mr. VOLKMER. You would like to be more involved in that?

Mr. VALENTA. Absolutely.

Mr. VOLKMER. All right. What if we had something like in the Chrysler situation where, or in the Keyworth initiative, where a labor representative was either on the industry board of directors or in a panel like the Keyworth initiative?

Mr. VALENTA. I would support that. Now labor leaders years ago would not dare make that statement. But I will tell you, the way that I look at it today is, I just think that some of these unilateral decisions that are made in these board rooms are certainly not in the best interest of the workers in those particular companies and also in our country as well.

Mr. VOLKMER. They may not be in the best interest of management either, it appears to me. I mean if an act of management, and what I am seeing in the Wheeling-Pittsburgh situation, what may develop because of an activity of management, generated anyway, that we could very well end up with losing a steel mill. What do they have, four?

Mr. VALENTA. Yes.

Mr. VOLKMER. Right. That could be gone. And it appears to me that it is going to be very difficult to get out of that situation. Do you agree with that?

Mr. VALENTA. Absolutely.

Mr. VOLKMER. And I, for one, and I think everybody on this panel would not want to see that type of activity continue for the future or we will not have any steel industry in this country.

Mr. VALENTA. That is right.

Mr. VOLKMER. It appears to me that there are some of those, at least, in management and in those board rooms in industry that do have more of—recognize labor more in their determinations, is that correct?

Mr. VALENTA. That is right.

Mr. VOLKMER. It is not like what it was 30 years, 40 years ago, right?

Mr. VALENTA. Definitely not.

Mr. VOLKMER. OK.

Mr. VALENTA. Well, these LMPT programs that we put together I think prove that. But you cannot have a situation where management is talking out of both sides of their mouth either. If they are talking about these kind of participative management programs and yet they are contributing to the right-to-work campaign and they are against labor law reform, I mean, you know, it just does not make sense. And if we can get to that cooperative attitude between both parties, and with the help of the Government. I really believe it has got to be tripartite. I definitely believe it has got to be tripartite.

Mr. Volkmer. Now, is it true that we are approaching a new round of labor negotiations in the steel industry?

Mr. Valenta. In 1986. By the end of this year we will have had our wage policy committee together and we will be meeting as an industry conference. And I imagine we will probably be at the table before the end of the year.

Mr. Volkmer. All right. Now, Doctor—

Mr. Valenta. Can I say one thing else, please?

Mr. Volkmer. Yes.

Mr. Valenta. You know the companies have already served notice on us that there will be no more coordinated bargaining in basic steel. Up until these negotiations, we sat at the table with all of the steel corporations together. Now they have pointed out that when we go into the 1986 negotiations that is not going to happen.

And one other thing the corporations did to us in the last negotiations. They eliminated the ENA, which was the experimental negotiating agreement, whereby we did not have a right to strike. Now, you know, I really wonder what is going to happen in these 1986 negotiations.

Mr. Volkmer. Well, maybe preliminary, David Roderick, chief executive officer of United States Steel, as I understand it, told the Senate, a hearing before the Senate, that the industry had given up too much to labor. Do you believe this to be the case?

Mr. Valenta. Well, I am sure—

Mr. Volkmer. I am not trying to feed anything. But I just want to get your reaction to a statement like that.

Mr. Valenta. Well, he probably believes that, except when it comes to his own salary.

Mr. Traficant. I believe the records would indicate that the standard discussed in that particular code are not necessarily practiced by the chairman in his own compensation from the company.

I would just like to thank you both for being here and the excellent testimony you have offered. I thank you for being here and if you have any other specific concerns—

Mr. Volkmer. Before we recess, ask for Dr. Roblin to come back up.

Mr. Traficant. And I would go ahead and excuse this panel.

I would ask here, in the several minutes we have remaining, if Dr. Roblin of LTV would return upon request. I will defer to Mr. Volkmer initially.

Mr. Volkmer.

Mr. Volkmer. Dr. Roblin, we heard here about the LTV specialty steel. Is that in the process of being sold?

Dr. Roblin. There was an announcement made that it is for sale; yes, sir.

Mr. Volkmer. It is for sale.

Dr. Roblin. There have been no negotiations to that effect though.

Mr. Volkmer. There was an assumption made here that the probability was that there was a means to be able to obtain needed cash for debts, whether short term or long term.

Dr. ROBLIN. In my written testimony I submitted the statement of Raymond Hay, who is the CEO of LTV, describing the restructuring program for the corporation. And one aspect of that program was to try and generate approximately $500 million through the sale of assets. So I have to assume that the announcement with regard to specialty steel is a part of that program.

Mr. VOLKMER. Is a part of that, all right. Now as far as—if you have not any profits you do not really have to worry about the criteria of taking net profits from the act that we passed last year and applying it all to modernization, do you?

Dr. ROBLIN. That is correct. Unfortunately that is correct.

Mr. VOLKMER. I am just really wondering how that meshes. How many steel companies are making a profit today in steel?

Dr. ROBLIN. Very few today. Very few today. But as I indicated—

Mr. VOLKMER. So really that does not mean that much does it, that provision in the act?

Dr. ROBLIN. As far as compliance with the law at this point it does not. But as I tried to point out, we certainly feel that modernization is in our best interest. And I think most of the industry does.

Mr. VOLKMER. It is the only way you can stay in existence.

Dr. ROBLIN. Absolutely.

Mr. VOLKMER. OK, thank you very much.

Mr. TRAFICANT. I have a brief question here. Insofar as you closed down Aliquippa and you have taken this stand in streamlining, what are your current plans or future plans as far as modernizing and continuing to develop your Mahoning Valley operations?

Do you have any plans on the drawing board for this specific region insofar as you have divested yourself of certain financial problems in other areas and you have made a decision to concentrate it and to move forward with your production into an area that you can be more competitive, more contained, and evidently we are one of those particular regions. What, if any, are your plans to modernize or to expand in this particular area?

Dr. ROBLIN. Our main capital spending plans for this particular area call for modernization of existing facilities. We haven't at this point announced any plans to build new additional facilities of the sort that Mr. Valenta talked about at Cleveland.

Mr. TRAFICANT. So that there is still that option available. It just may be in the strategic planning element and it may focus in on this area as well?

Dr. ROBLIN. Certainly it is an alternative.

Mr. PACKARD. Would the gentleman be kind enough to yield?

Mr. TRAFICANT. Yes, Mr. Packard?

Mr. PACKARD. We saw on the way in this morning some closed facilities of I guess what used to be Republic. Is there any intent of reviving or putting that back in operation or modernizing those facilities?

Dr. ROBLIN. These would be our blast furnace facilities in Youngstown? I am not sure which ones you are talking about.

Mr. PACKARD. It must be.

Dr. ROBLIN. There are no current plans for that.

Mr. PACKARD. OK. I would not think so.

Mr. TRAFICANT. All right, thank you, Dr. Roblin. Anybody else have any further questions?

I want to thank the chairman, Mr. Volkmer, from Missouri. His leadership, I am sure, will be reflected in the report of the committee. And Mr. Packard who does not have, for those of you who are here, does not really have an awful lot of steel production in his particular district, but has shown a concern and a leadership throughout and was kind enough to come here. So I thank both of you for being here.

Mr. VOLKMER. But Mr. Packard also has problems with imports. He can tell you that. That is another story.

Mr. TRAFICANT. This hearing is officially closed now but I will remain for those who would like to ask some questions in regard to any of the testimony today for your own particular information. I thank you.

[Whereupon, at 3:25 p.m., the subcommittees were adjourned.]

APPENDIX A

LTV Steel Company

LTV

August 28, 1985

Subcommittee on Investigations and Oversight
822 HOBA #1
Washington, DC 20515

Attention: Tina M. King

Subject: 7/22/85 Testimony at Field Hearing, Youngstown, Ohio

This is to suggest that the transcript of this hearing be changed to correct errors in transcription and clarify certain sections as follows:

Correct	line	1807	"of new technologies" to "in new technologies"
"	"	1820	"and the" to "and"
"	"	1840	"compliment" to "complement"
Correct	line	1844	"products primarily" to "products, primarily"
"	"	1856	"requirements by supplying" to "requirements of our parent corporation by supplying"[1]
"	"	1867	"presidents, in their organizations", to "presidents and their organizations"
"	"	1897	"fanancial" to "financial"
"	"	1923	"because the" to "because of the"
Correct	line	1935	"competitive advantages or disadvantages" to "competitive disadvantages"[2]
"	"	1962	"on example" to "one example"
"	"	1972	"I am away" to "I am aware"

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[1] See page 240.

[2] See page 241.

LTV STEEL COMPANY • CORPORATE PLANNING • LTV STEEL BUILDING • POST OFFICE BOX 6778 • CLEVELAND, OHIO 44101 • TELEPHONE (216) 622 5005

"	"	2087	"technology not can" to "technology, nor can"
"	"	2108	"bargain for" to "bargained for"
"	"	2113	"Ltv" to "LTV"
"	"	2164	"was idle" to "was idled"
Clarify	line	2341 & 2342	by adding after "decline" in line 2342, "That is, I do not expect the 3.7% rate of decline to decrease appreciably in the near future"[3]
Correct	line	2467	"suffering, poor" to "suffering poor'
"	"	2536	"ledger germaine" to "legerdemain"
"	"	2567	"competitive" to "competitively"
Clarify	Line	2619	"There is" by adding "LTV at one time owned a 52.124% interest in Processadora Mexicana de Metales S.A."
Correct	"	2646	"No response from Mr. Roblin" to Mr. Roblin nodded affirmatively"[4]
"	"	2789	"Mr. Robin" to "Mr. Robins"
"	"	3571	"Mr. Robins" to "Mr. Roblin"
"	"	4101	"restructing" to "restructuring"

In answer to Representative Traficant's questions about LTV's alleged ownership interest in a Mexican "steel operation" (lines 2614-2645), LTV does not own any interest in such an operation. However, LTV did previously own 53.124% interest in Processadora Mexicana de Metales (Promex), a small galvanizing job shop. In December 1984, LTV sold that interest to Grupo IMSA S.A. de C.V., a Mexican company producing galvanized products.

Promex, located near Mexico City, commenced operations in the early 1970's and was established to produce galvanized culverts, guardrails, floor grating, etc. However, the marketing of these products was never successful and as a result Promex's main line of activity was directed to job shop galvanizing, acting as a third party contractor to galvanize up to 1,000 metric tons per month of steel structurals, tubing and other steel products for different Mexican producers. Promex therefore sells only its galvanizing services, and a very limited tonnage of galvanized corrugated nestable culverts.

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[3] See page 481.

[4] See page 486.

Promex has never exported to the U.S., and in fact, its only exports have been negligible culvert tonnage to Central America in the mid-seventies. Practically all of Promex's product or services have been sold in Mexico. The plant employs between 35 and 50 people, depending on its order workload.

Promex has had a contract with LTV to act as its sales agent for a number of Mexican accounts, importing LTV's steel products into Mexico. In the mid to late seventies, this activity was a significant source of income for LTV (Republic Steel). However, as Mexico's economy deteriorated, the Mexican government severely restricted imports and this activity has been drastically reduced. It is hoped that today's more liberal rules, which allow entry of foreign sourced steel in some particular cases, may again permit LTV's product to be exported from the U.S. to Promex customers.[5]

No equipment from Aliquippa has been or is now in the Promex plant, and in fact, Promex had been sold before the Aliquippa idling.[6]

In answer to another question (line 2807), a total of 870 workers have participated in the Midland Center for Career Development and since the hearing, additional participants have been placed in jobs, so that 377 displaced steelworkers have now found new jobs.[7]

And in answer to another question (lines 2812-2819 and 2823-2825), LTV Steel has not requested any direct government assistance for maintaining the operation of its plants nor has LTV requested any Federally subsidized "jobs programs" for this purpose. As outlined in my testimony, LTV Steel has requested and received state funds, particularly in Ohio, for retraining our workforce either to operate new equipment associated with major capital investments or to become proficient in new technology, novel operating systems or improved labor-management interactions. The only Federal funds of this sort were for the purpose of retraining displaced workers as discussed in my description of the Midland Center for Career Development.[8]

I have also attached a copy of the full page Wall Street Journal ad mentioned in my testimony. Please let me know if you need any further information.

Sincerely,

J.M. Roblin

J. M. Roblin
Director of Strategic Planning

JMR:ah

cc: H. V. Kelly

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[5] See page 486.
[6] See page 489 and 491.
[7] See page 491.
[8] *Ibid.*